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Parent Perceptions of a One-to-One Laptop Program

Lewis Hayes Chappelear
Walden University

Walden University

College of Education

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Lewis H. Chappelear

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Dr. Patricia McGee, Committee Chairperson, Education Faculty
Dr. Paula Dawidowicz, Committee Member, Education Faculty
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Chief Academic Officer
Eric Riedel, Ph.D.

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Abstract

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Lewis H. Chappelear

MS, Columbia University, 1995

BS, Boston University, 1994

Dissertation Submitted in Partial Fulfillment

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Abstract

Parents are important to the success of the one-to-one computing programs that are becoming more commonplace in secondary classrooms. Parents' opinions can influence the success of these programs or doom them to failure; however, little is known regarding parents' attitudes about these programs. To understand parental attitudes toward a one-to-one laptop program, this qualitative exploratory case study used Rogers's diffusions of innovations theory on how new ideas and technologies spread. Participants included 11 parents of students attending 2 urban secondary schools with similar demographics in the southwestern United States. Data were collected through focus group sessions, follow-up interviews, and relevant documents. Data were analyzed through qualitative content analysis and coding. Findings revealed that parents loved the one-to-one laptop program, saw technology to be a right of all students, thought that the district-managed laptops were used more for academic rather than educational purposes due to content filters and other restrictions, and believed that a central school-wide technology support system available to all stakeholders, including parents, was critical to the success of the one-to-one laptop program and approval by parents. This study may create positive social change by providing new insights and beneficial tips to educational organizations looking to use one-to-one laptop programs most effectively.

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Chapter 1: Introduction to the Study

Introduction

Many educational initiatives have been implemented across the United States, as well as throughout the world. Leaders in education have shifted questions about whether if technology can be used in education to conversations about how it can improve learning (USDOE, 2017). As a result, many schools have opted to provide students with individual laptops to use at school and at home (Léger & Freiman, 2016). This marriage of education and technology has the potential to be a powerful tool for improving student learning and teaching them 21st-century skills (Tallvid et al., 2015). To improve learning outcomes, many schools have opted to provide students with individual laptops to use at school and home (Léger & Freiman, 2016). Although there have been many studies conducted exploring the benefits of such laptop use on students' motivation, attitudes or beliefs, leadership and information, and technology skills, no research has explored how the parents of high school students feel about such programs, particularly the one-to-one laptop program (Léger & Freiman, 2016). Because most high school students live with their parents and, arguably, abide by household rules, it would be beneficial to explore how this group of stakeholders perceives the benefits of implementing educational technology for increased learning.

A study conducted in 2016 by Sanders et al. evaluated parents' perspectives regarding their children's general technology use, including televisions, tablets, videogames, and computers. The researchers found that the parents' own experience and comfort with using such media devices greatly influenced their technology-related

parenting strategies. For instance, parents who commonly use technology themselves are more likely to allow their children to use technology more. However, the way that parents communicate their opinions and perceptions regarding technology use also significantly influences their children's perspectives of technology (Sanders et al., 2016). Therefore, for educational technology implementations in schools, such as the one-to-one laptop program, to successfully improve the learning outcomes of high school students, it is imperative for these children's parents to perceive technology as beneficial, to allow their children to take advantage of this opportunity. However, there is currently no research about parents' perceptions concerning their high school students' use of technology in a one-to-one laptop program for in-school and at-home educational purposes. The current study aims to address this gap in the literature.

The ubiquitous nature of technology has led to near constant use, especially on behalf of teens. According to a study conducted by the Pew Research Center, Lenhart (2015) uncovered that with the availability of handheld digital tools, such as smartphones and portable computers, daily Internet use among teens in the United States had reached 92%, with 24% of teens admittedly using technology on a near constant basis. This technology use has become so saturated into the teen culture that it has reached a point of critical mass that, according to Rogers (2003), suggests that technology use by teenagers is at a pivotal point where diffusion of the phenomenon has begun to saturate another group. In the context of this study, this "other group" refers to the field of education, its associated stakeholders and, of course, the students.

Just as technology use amongst teens has been increasing, the field of education

has experienced an ongoing upward trend in the use of technology as a learning tool in the classroom (McKnight, O'Malley, Ruzic, Horsley, Franey, & Bassett, 2016). The increase particularly entails the frequency of the one-to-one laptop program, which is a school initiative that provides every student and teacher with a personal laptop that is up-to-date and connected to the Internet. The presence of this program has been found to yield positive outcomes, markedly in the core subject areas of mathematics, science, English, and writing (Zheng, Warschaeur, Lin, & Chang, 2016). Thus, it is evident that the students' educational use of technology may simply mirror the widespread use of technology in society (Rashid & Asghar, 2016).

It is evident that teen use of mobile technology in their personal social lives has reached critical mass, where the idea of technology use has been fully adopted by this generational group (Lenhart, 2015; Rogers, 2003). Educational systems have a vested interest in technology as a teaching and learning tool, and these interests are represented by stakeholder attitudes, beliefs, and opinions. One highly prevalent technology program implemented in schools is one-to-one computing, as previously stated (Islam & Andersson, 2015; Simmon & Martin, 2016; Tallvid et al., 2015; Zheng, Warschauer, Lin, & Chang, 2016). Researchers have been aware of several trends: increased acceptance of digital technology use among older persons (Luijkx, Peek, & Wouters, 2015), increased adoption rates of females nearing adoption rates of males, and in some cases exceeding them (Abedalaziz, Jamalduddin, & Leng, 2013), immersion of youth in technology use in all aspects of life since birth (Ardies, De Maeyer, Gijbels, & Keulen, 2014), and increased technology use by teachers as they have become more confident and

experienced in their use (Nikolopoulou & Gialamas, 2015). However, there remains a gap in the literature, which reveals that researchers know little about a critical group of stakeholders—the students' parents (Bate, MacNish, & Males, 2013, Blackwell et al., 2013). A deeper understanding of the attitudes and opinions of the students' parents is relevant because specialized programs, such as the one-to-one laptop program, require both public and private funding (Kitchen & Berk, 2016). In fact, this financial support is critical to bring educational technology programs into classrooms and schools (Whitehead, Jensen, & Boschee, 2013). To garner this support, it is necessary to gain a deeper understanding of the parents' attitudes toward technologies, both inside and outside of the classroom. This research is significant because it may provide greater insight to the larger community of schools, boards of education, educational organizations, and the broader educational community, which may then be able to use this information to make informed decisions regarding professional development, development of parent trainings, technology purchases, and educational technology-related activity.

In this chapter, I address each element of the research. Beginning with the research background, I elaborate on the gap in the recent literature concerning the attitudes of the parent stakeholder group toward the use of educational technologies, namely the one-to-one laptop program. The research problem is provided and framed in regard to current research, followed by the purpose of the study, including its intent and scope of interest. I then present the research question that directs this study and identifies the theoretical framework that underpins this study. I present the structure of this

research, followed by the nature of the study, definitions, assumption, scope and delimitations, and limitations. The chapter concludes with a discussion of the potential contributions of this research and the implications for positive social change in the field of education and beyond and closes with a chapter summary.

Background

In this section, I present a review of current literature to provide knowledge about technological initiatives in schools and parents' attitudes and opinions toward its use, both inside and outside of the classroom. In particular, the 21st century has brought forth an increase in the number of one-to-one laptop programs in educational settings, both nationwide and internationally (Harper & Milman, 2016; Zheng, Warshauer, Lin, & Chang, 2016). The one-to-one laptop program is a school initiative that provides every student and teacher with a personal laptop that is up-to-date and connected to the Internet. Placing a single, one-to-one, portable computing device into the hands of every student in a single school has been found to yield positive results, which include improved performance in writing, mathematics, English and science (Harper & Milman, 2016; Zheng et al., 2016). The use of technologies in academia has also been found to be connected to enhanced learning outcomes, increased student engagement and improved organization management skills on behalf of both students and teachers (McKnight et al, 2016; Perrotta, 2013).

The success of such a program, however, does not happen immediately. Realistically, it takes more than one or two years for this type of program to be fully adopted by both the students and the teachers (Harper & Milman, 2016). Not only may

technical difficulties emerge, but Harper and Milman found that teachers need to find the most successful ways to incorporate this new technology into their teaching structure, as well as to ensure that students are using the laptops for their intended purpose and not recreationally. Students also need to acclimate to a new learning process and its associated expectations. Furthermore, equal access to the Internet, hardware, and software applications need to be ensured. Issues outside of the classroom, such as students not having Internet access at home, need to be addressed as well. Ongoing technical support as well as professional development for the school faculty has been found to be necessary for the success of such a program (Baran, 2016). For these reasons, such an implementation of educational technology must be undertaken with long-term goals in mind (Pierce, 2016).

Despite the marked success of digital technologies in the classroom, the phenomenon has been met with controversy. In the past, students' parents were the key decision-makers regarding their children's technology use (Pereira, 2016). However, because schools have become responsible for making this decision, parents are forced to adjust to this new parenting obstacle. Commonplace children's learning tools, such as scissors, crayons and paper, have been widely believed to positively affect children's development; however, the presence of technology, such as videogames, televisions, and computers, have been more controversial, and research has shown that they yield mixed results (Vittrup, Snider, Rose, & Rippy, 2016). Because technologies have been largely used for socializing and entertainment, parents have found it equally important to regulate the time spent using these devices, as well as the content provided via these

devices (Pereira, 2016). Moreover, Zheng et al. (2016) found that the implementation of the one-to-one laptop program may not have the intended consequences of increasing students' on-task devise use during class time. These examples justify the reasoning as to why, according to Mitchell, Parlamis, and Claiborne (2015), change has been slow and has often been met with conflict and ambivalence regarding the use of digital technology.

Teachers typically have made decisions every day regarding the tools and resources used to support and facilitate student learning (Aubusson, Burke, Shuck, Kearney, & Frischknecht, 2014). These choices have been guided by the teacher's belief system and self-efficacy to confidently use these tools most effectively. According to Aubusson et al. (2014), teachers have tended to prefer lessons that incorporate the use of technology, are authentic and relevant to their students' lives, are performed in groups, include the use of several resources, and incorporate the teacher's teaching design. Despite the teachers' competency levels, beliefs, and attitudes; however, they are ultimately bound by public policy, access to resources, and infrastructure (Aubusson et al., 2014). Many educational institutions have required teachers to use an institution-wide system, rather than allowing them the flexibility to decide their own methods and modes of transmitting their curriculum to their students (Buchanan, Sainter, & Saunders, 2013). Buchanan et. al (2013) found that these are two main barriers associated with adopting new learning technologies: the perceived usefulness of the new educational technology and structural constraints within the organization, such as provisions of resources and technical support. This notion is consistent with the findings of Aubusson et al. (2014), which support that teachers are bound by regulations, restrictions, and access to resources

that can affect their ability to introduce non-traditional educational tools, such as digital technology, into the classroom. These studies suggest the need for adequate provisions of digital technology and integrated support structures in order for new learning educational technology systems to be successful and sustainable.

Many issues are associated with implementing one-to-one laptop programs, including technical issues and acceptance by stakeholders. According to the findings of Zheng et al. (2016), the dynamic of disbursement of computers throughout a school but having them unavailable to all students simultaneously has had a marginal effect on the students' performance outcomes. This suggests that if technology is available to some students in a specific school, it must be available to all students in that school and should not discriminate due to the financial status of the students' parents. However, this notion grants the responsibility of the technology presence into the hands of the schools, which are strictly limited by available funding.

Simmons and Martin (2016) examined the barriers of the implementation of a one-to-one laptop program in a large, urban school district in the United States. The themes that emerged from the researchers' data included planning, professional development, funding, self-efficacy, attitudes, and behaviors. According to the findings, marketing and communication plans were vital to the success of a new technological initiative and the most important stakeholder groups, parents and the local community, were often overlooked in the process. Findings imply that stakeholder groups must fully comprehend the value of educational technological tools, and researchers, in turn, must understand these stakeholders' attitudes and opinion, so as to make informed and

effective decisions to ensure program success. Public policy has been strongly linked to the availability of public and private funding (Kitchen & Berk, 2016). The availability of funding has been a core reason as to why the use of digital technology in educational settings remains un-proportionate (Mitchell et al., 2015). The use of technology in academia has been precipitated by the use of personal computers, familiarity with the Internet, improvement in technology and accessibility, and increase in the demand for using technology in an educational setting. However, as stated, without the proper resource pool—namely, financial contributions—the presence of universal technology in educational settings is less attainable.

In the context of this study, the stakeholder group that has received little attention in research is that of parent stakeholders. Because high school adolescents are subjected to their parents' household rules, if their parents do not approve the use of technology or limit the time that their children are allowed to use it, children may not reap the full benefits of a one-to-one laptop program (Sanders et al., 2016). These students may fall behind in school if their peers are successfully using technology that they are not allowed to use due to parental restrictions. In addition, if parents exhibit negative views regarding the use of technology, children may adopt similar views and may be reluctant to explore the benefits that educational technology may provide (Sanders et al., 2016).

By understanding the attitudes and opinions of parent stakeholders, the results of this study may assist educational systems with making decisions that regard the demand for technological initiatives in schools, as well as the concerns of the parent stakeholder group. By understanding the parent stakeholders, the educational systems can tailor their

demand for technologies to appeal to the students' parents, whom contribute private funding and therefore make these initiatives possible. According to Rogers's (1995, 2003, 2010) diffusions of innovations theory, the theoretical framework that underscores this study, the relative advantage, compatibility, trialability, observability and complexity of an innovation will help its adoption to spread amongst a group of people. In this dissertation study the diffusions of innovations theory helped understand how the parent stakeholder group perceived the marriage of technology and education. The deeper understanding of the attitudes and opinions of the parent stakeholder group will enable educational systems to tailor their programs and marketing solutions—with regard to the one-to-one program—to garner the support of these parents.

Problem Statement

In the 21st century, digital technologies have become common tools for learning in an educational setting (Islam & Andersson, 2015; Nelson, Fien, Doabler & Clarke, 2016). In a learning environment, technology can make classes more engaging and increase student motivation, commitment, and performance (Devlin & McKay, 2016). Torres, Infante, and Torres (2015) found a positive association exists between the use of technology and academic success, as well as encouraging effects on spatial skills, memory, and information processing. Moreover, schools have increased incorporation of technology into the everyday experience of students and, moreover, placing take-home devices into the hands of every student has become more commonplace (Zheng, Warschauer, Lin, & Chang, 2016). Consequently, there is an ongoing need to explore and comprehend the use of these technologies that are used *outside* the classroom and the

interaction between technology and users, namely students and teachers (Islam & Andersson, 2015), so that administrators, faculty, and decision makers can make educated choices about educational technology and provide the supports required to make its use effective. Because students use smartphones, tablets, and laptops at home, parents have more say and have an impact on student use of technology than ever before.

Little information is available about the attitudes and opinions of the parent stakeholder group regarding the use of technology for learning or how and if parental attitudes have an impact on laptop program implementation. Although schools and districts have investigated the concept of one-to-one laptop programs, more research is needed to understand and inform the stakeholders associated with these systems (Crook, Sharma, & Wilson, 2015; Robinson, 2016). By thoroughly understanding the attitudes and opinions of the parent stakeholder group, the respective educational systems can appeal to this group, so as to ultimately achieve unanimous support of technology in the classroom. Educational technology in schools requires significant initial and ongoing public and private funding, with high, long-term sustainability costs (Kitchen & Berk, 2016). Blackwell et al. (2013) found that parents and school leadership members are the gatekeepers of technology adoption in education and parental support has proven to be a vital component in the successful implementation of technology use for educational purposes (Bate, Macnish, & Males, 2013; Pereira, 2016; Sanders, Parent, Forehand, & Breslend, 2016). In order to garner support, educational decision-makers must understand all stakeholders' attitudes toward technology use, both inside and outside of the classroom. This study attempted to gain insight into the parents' perspectives regarding

their children's use of technology at school and at home. The findings and results of this exploration can add to the literature and help those in educational organizations in the design and implementation of future one-to-one laptop initiatives or to make current ones better.

Purpose of the Study

My purpose in this qualitative, exploratory case study is to examine the perceptions of the parent stakeholder group regarding the involvement of their children in a one-to-one laptop program at two large, urban secondary schools in the southwest United States. My objective in this research was to provide insights and answers that educational systems can use to develop an understanding so as to appeal to this stakeholder group and yield critical funding necessary for the presence of technology in the classroom. At this stage in the research, the perceptions of the parent stakeholder group is generally defined as their opinions, beliefs, and attitudes toward their children using take-home laptops. A case study design was used to develop a deeper understanding of this complex social phenomenon and provide a holistic, real-world perspective that is exploratory, descriptive, and explanatory (Yin, 2014). Moreover, the case study design can enable schools, districts, and other local, state and federal agencies to further understand the impact that one-to-one laptop programs have on parents: one of the most influential stakeholder groups that has received little research attention with regard to this topic. The case study design was most suitable for this study, as it provided a first-hand perspective on behalf of the parent stakeholder group, with regard to the presence of the one-to-one laptop program in schools.

The benefits of using technology for educational purposes can improve learning outcomes (Darling-Hammond, Zeilinski, & Goldman, 2014; Harper & Milman, 2016; OECD, 2015; Zheng et al., 2016). Conversely, no studies have been conducted to learn about how the students' parents feel about such programs (Léger & Freiman, 2016). Because parents can decide what rules to implement in their households, their children's use of a take-home laptop ultimately depends on how the parents feel about it (Hiniker, Schoenebeck, & Kientz, 2016; Johnson, 2014; Nikken & Haan, 2015). Thus, the use of a laptop which requires Internet access can be problematic if parents do not approve of their children using the Internet and may restrict their usage by either not having Internet at home, or setting time limits on how long their children can use their computer. For this reason, it is important that there is parental buy-in into a one-to-one laptop program for educational purposes. If parents who have negative perceptions of technology or restrict their children from using technology could be shown the true benefits of such a program, they may be more comfortable with their child having a laptop. It is therefore crucial that we explore parents' perceptions of the implementation of a one-to-one laptop program in their children's high schools, in order to find ways to assuage these parents' concerns so they ultimately approve of the program. With parental buy-in and motivation, their children will be much more likely to adopt and properly use technology for educational purposes, leading to greater learning outcomes and the acquisition of information and communication technology skills.

Research Question

In this study, I focused on one overarching research question: What are the

perceptions of parents regarding the involvement of their high school-aged children in a one-to-one laptop program in school?

Conceptual Framework

Rogers's (2003) diffusions of innovations theory served as the theoretical framework for this study. This theory is used to underscore the research presented throughout this study to provide an understanding of how and why different groups of people support new innovations across different communication channels, and why some populations take longer to adopt new innovations than others. According to Xiaojun, Ping, Jun, and Spil (2015), this is one of the most popular theories used to understand the diffusion of new information amongst single communities and across multiple communities. Within the context of this theory, *innovation* refers to "an idea, process, or a technology that is perceived as new or unfamiliar to individuals within a particular area or social system" (Rogers, 2003). This theory states that "four foundational factors determine the success of an innovation: communication channels, the attributes of the innovation, the characteristics of the adopters, and the social system." There are also five qualities that determine the benefits of an innovation, which include relative advantage, compatibility, complexity, trialability, and observability.

In addition to understanding the diffusion of the innovation itself, Rogers (2003) used his theory to understand the characteristics of individuals that help share new information. In doing so, he categorized the population into five distinct groups that reflect their perceptions and feelings toward a new innovation: innovators, early adopters, earlier majority, later majority, and laggards. According to Rogers, approximately 2.5%

of the population are considered innovators, which are the ones that most readily and easily adopt new innovations. Early adopters, who are individuals that are well informed about new innovations, comprise 16% of the population. Earlier and later majority adopters, which comprise 68% of the population, represent the average degree by which people adopt new innovations. The individuals that are most resistant to adopting an innovation due to lack of resources insight, known as laggards, comprise 16% of the population. However, regardless of category that explains an individual's behavior with regard to innovation, Rogers's (2003, 2010) theory supports that the organization of a social system—the composition of the five adoption categories mentioned—influences the individuals' perceptions toward the innovation, which therefore affects the speed by which the innovation is adopted by the population as a whole (Xiaojun et al., 2015, p. 4). Thus, the interconnectedness and operations of a social system are core to the level and extent of successful innovations.

Application of Rogers's (2003) diffusions of innovations theory helps determine the reasons why some population groups are more reluctant than others to accept the use of digital technologies in schools. For this study, exploring parental reasoning about take-home laptops provided insight as to why the rate of diffusion of the technological innovation of one-to-one laptop programs had not been fully approved by the parental stakeholder group. This theory was used throughout to explore parents' attitudes in their role within the school system, with the focus weighing on the relative advantage perceived by the group rather than the individual rate of adoption. In this context, this theory was most appropriate for reference throughout this study, as it served to explain

how populations collectively came to adopt new innovations rather than the individual rate of adoption.

Nature of the Study

The nature of the study was a qualitative exploratory case study (Yin, 2014). This type of study is used to investigate phenomena that has a lack of detailed research that takes place in an environment that limits the choice of methodology (Mills, Durepos, & Wiebe, 2010). The case study design was selected because it allows me to examine the attitudes of parents as a group within the larger social system of the school to reveal their articulation of the relative advantage relating to one-to-one laptop programs at two urban secondary schools about which little is known. For the purpose of this study, I defined cases as two urban secondary schools with similar demographics in the southwestern part of the United States. The use of an exploratory case study was chosen to enable a deeper exploration of the parents' perceptions, while also considering the influence of school location and the variation of associated attributes of program implementation. Each school was considered as one case. The study participants were defined as the parents of children who have participated in a one-to-one laptop program for at least six months in one of the two schools. The case data included a range of sources, with parent perceptions gathered from both cases along with documents and archival materials, to ensure that any outliers or misstatements were offset by other parents' perceptions (Olsen, 2012; Yin, 2014). An adaptable approach was used so that true results could be confirmed through an exploratory nature and triangulated data (Olsen, 2012; Yin, 2014). Data included a complete set of transcripts produced from what was said during the focus

group sessions as well as what was said during the follow-up one-to-one individual interview sessions. I intended to use additional data such as school documents and agendas from parent meetings, but I found little. These multiple sources of exploratory data also served to ensure construct validity (Yin, 2014). Analysis of data was conducted through qualitative content analysis (QCA) and coding was aligned with the theoretical framework of Rogers's (2003) diffusions of innovations theory. This coding schema included research questions and subsequent interview and follow-up questions, as well as perception type (i.e., attitudes, opinions, and beliefs). The objective was to uncover patterns, understand the connections between the parents' perceptions, and identify outliers to uncover a convergence of data lines and find triangulation (Yin, 2014). The use of NVivo, a computer software program, aided with the data analysis process to organize, manage, and analyze the qualitative data.

Definitions

21st-century skills: An overarching term used to express the skills, knowledge and dispositions needed for success in the 21st century global and interconnected society (Germaine, Richards, Koeller, & Schubert-Irastorza, 2016).

Adoption: A decision by a person or other entity to make full use of an innovation (Rogers, 2003).

Attitude: A general appraisal or evaluation that a person holds regarding a particular entity, such as a person, a problem or concern, or an object (Lavrakas, 2008).

Communication channels: The process by which people share and connect with each other to exchange information, thoughts, and material in order to gain mutual understanding (Rogers, 2003).

Compatibility: The degree of consistency between the innovation and the surrounding modern-day society (Xiaojun et al., 2015, p. 3).

Complexity: A term used to describe the extent that an innovation is believed as "difficult to understand, implemented or used" (Xiaojun et al., 2015, p. 3).

Diffusion of innovation process: The spread of an idea through different communication channels to members of a social system who may decide to experiment with the idea and later decide to reject or adopt it (Rogers, 2003).

Innovation: "An idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12).

Mobile computing device: A portable computer that can be powered by a battery and easily held in one's hand. Such devices may include reader-type devices, tablet-type devices, phone-type devices, and small laptop computing devices that are Internet connected and can easily be carried and used on the go (Milota & Price, 2016)

Observability: The degree to which potential adopters of an innovation understand the benefits of said innovation (Xiaojun et al., 2015, p. 3).

One-to-one laptop program: A school initiative that provides every student and teacher with a personal laptop that is up-to-date and Internet connected.

Perception: A mode of interpreting reality and one's own experience through opinion, judgement, meaning, and understanding (Given, 2008).

Relative Advantage: The degree to which an idea is perceived to be better, more efficient, and easier to use (Rogers, 2003).

Self-efficacy: An individual's comfort in believing that the future can be controlled (Rogers, 2003).

Social system: A set of interrelated units, such as a group of people that are engaged in the process of problem solving (Rogers, 2003).

Traditional classroom: A didactic classroom model that is instructor-centered (Gale, 2016).

Trialability: The process of experimenting with an innovation otherwise recognized as putting the innovation "on trial," with minimal commitment and investment in the innovation (Xiaojun et al., 2015, p. 3).

Assumptions

To conduct a scholarly and significant research study, it is critically important to collect the most authentic, reliable, and valid data (Yin, 2014). Along with this authentic, reliable, and valid data, there is the assumption that the information will be collected in a manner that also entails these qualities. Most critically, I strongly assumed the honest, thorough, and reliable participation on behalf of the participants. I also assumed that, for instance, the participants—the parent stakeholder group—approached the focus groups and the interviews in an honest, candid manner. The inclusion criteria of the purposive samples were appropriate and assured that the participants had all experienced the same or similar phenomena. Participants had a sincere interest in participating in the research study and did not have any other motives to participate other than to partake in the

information collection of this study. Finally, I assumed that the records obtained from the school district supply information that was both authentic and factual. These factors were assumptions because I and/or any stakeholder associated with the study could not control them, but merely, I assumed that these assumptions were facts, to present a most accurate collection of data.

Scope and Delimitations

The scope of this study was to explore the attitudes and opinions of the parents of students participating in a one-to-one laptop program. The study sample participants were the parents of high school-aged children who had participated in a one-to-one laptop program for at least six months at one of two high schools in an urban school district. The study was conducted during the Fall 2017 semester. I collected information from parents of students attending one of two high schools, rather than chiefly one high school, so as to ensure external validity and that the findings were relevant to others beyond the case boundaries. However, it is understood that transferability in qualitative case studies may be difficult to achieve (Yin, 2014). While findings may not be readily transferable, they can provide basis for future research. The focus group and interview questions were designed specifically to achieve a deeper understanding of parents' attitudes toward their children's use of take-home laptops as part of the one-to-one laptop program at the schools in question.

Limitations

There are several limitations at play throughout this research study. The first limitation was that the use of focus groups as the chief method of questioning the

participants is not standardized and may differ according to the individual situations (Vicsek, 2010). A participant in one focus group, for example, may discuss an issue that directs the conversation toward a particular issue, whereas in other sessions, the discussion may consist of a different situation. The circumstances discussed in the focus groups were therefore a direct result of the participants' experiences, attitudes, and opinions.

The parent stakeholder group participants were a small sample selected based on student participation in the program and not on parent characteristics alone. However, this sample was not be representative of all parents, but select parents who represented a wide range of demographics and backgrounds that may be found in many schools. This helped to achieve as much transferability as possible on behalf of the study (Yin, 2013, 2014). The comfort level, culture, technology experience, knowledge, and language varied amongst participants. However, parents were all fluent in English there for translation services were offered to parents whose first language was not English. All efforts necessary were offered in order to create a comfortable environment for each participant throughout the interview process.

Time was also a limitation factor, as well as the relationship between the parents and their children. Though the use of multiple sources of data to collect information during focus groups and follow-up interviews supported dependability and allowed for triangulation of data (Yin, 2014), a limitation which was a factor of the amount of time available to garner data from the participants, and the participants' ability to be as honest and candid as possible. Moreover, the relationship between the parents and their children,

as well as the amount of time they spend together, were uncertain factors. Parents had a variety of knowledge of exposure to their children's laptop usage both inside and outside of school, but again, the relationship structure and closeness between the parents and their children also varied.

There was the possibility that I might have exhibited my own biases due to personal experiences with technology use as a student and in his role of teacher in a high school in the same district used in this study. To counteract this bias, I pursued all efforts to reduce these biases, such as sharing his work with mentors and advisors, as well as taking notes and reflecting on any act that may not be neutral and objective (Yin, 2013). It is critical for the me to approach the participants, the students, and the school district as if these groups were indicative of any parent, any student, and any school district in the United States. This study therefore is void of any preconceived notions, particularly toward the school district itself, about which I vigilantly monitored.

Significance

Technology has helped humans with speech, gestures, performance, and other social rituals since ancient times, and modern technological advancements are merely an evolution of the tools that humans have used for hundreds of years (Crowley & Heyer, 2015). From a young age, 21st century children are exposed to a world that is saturated with technology and it is important to understand how this pervasive form of communication has affected their cognitive and social development (Vittrup, Snider, Rose, & Rippy, 2016). Subsequently there is an emerging desire to provide a better education by utilizing rich media and information provided by digital resources and

equipment in the classroom (Pereira, 2016). Digital literacy and education have become fundamental to economic survival in the modern world. Technology has become an integral part of everyday life for many people, and if used appropriately it has the ability to enhance experiences in schools, in the workplace and in one's personal life. Awareness of the positive effects of technology in the classroom is important if the general public is to support technological initiatives in national schools. Without public support, including that of the parent stakeholder group, the sustenance of these programs will be nonexistent. Public perception of technology in schools includes beliefs that have resulted in the deterrence of technology use in schools for educational purposes, instead opting for more traditional methods (Harper & Milman, 2016). Thus, regardless of the advantages of incorporating technology into the classroom, every member of society does not subscribe to this new vision for schools. However, researchers' understanding of stakeholder resistance particularly of parents' attitudes toward its use, has been identified as a research gap. This study is significant because educational technology is pervasive in classrooms, both nationally and internationally, thus understanding the perceptions of all its stakeholders and how technology can be used as a cognitive tool to help positively modify educational outcomes, the field of education can move closer to a current, beneficial learning experience.

Summary

Technology use has significantly grown and there is a trend toward the incorporation of digital management systems into all aspects of our lives (Devlin & McKay, 2016). Technology in the support of education is no exception, and has become a

high priority with an increased focus on the quality of learning and the economics of providing learning tools and equipment, such as one-to-one laptop programs (Islam & Andersson, 2015). This qualitative exploratory case study helps to fill the gap in the research by analyzing the attitudes of students' parents toward the one-to-one laptop program at two secondary schools in a large, urban school district in the southwest United States. The objective for this study was to allow politicians, school boards, philanthropic organizations, and others interested in supporting and funding technology in educational programs to garner support from critical demographic groups.

The next chapter presents a literature review that sets the foundation for this study. The chapter begins with an introduction, followed by the literature search strategy that was used to find current literature, as well as the theoretical framework—Rogers's (2003) diffusions of innovations theory—that is used to guide this study. The literature review explains the attitudes of different stakeholder groups toward technology in public education, including the K-12 education stakeholder groups, younger generations and older adults, as well as the differences amongst genders, socioeconomic and cultural influences, academic stakeholders, educators, students, and parents. This information follows with a discussion about barriers to the use of digital technologies in schools, which includes general barriers, resources, support, infrastructure, and teachers' self-efficacy.

Chapter 2: Literature Review

Introduction

Due to the ubiquitous nature of technology, it comes as no surprise that schools nationwide are introducing technology into the classroom (Islam & Andersson, 2015; Nelson, Fien, Doabler, & Clarke, 2016). Consequentially, the new learning tools that coincide with technology have birthed new teaching and learning strategies alike, requiring teachers and students to adapt to these changes (Bousbahi & Alrazgan, 2015). According to McKnight et al. (2016), the marriage of technology and education yields positive results, as students demonstrate a more elaborate discussion and content-rich collaboration when using technology in the classroom setting. However, introducing technology into the classroom has also been met with resistance which has been a persistent problem as members of important stakeholder groups maintain varying perspectives about students' use of technology, both inside and outside of the classroom. One of the stakeholder groups that has received little research attention is that of parent stakeholders, of which this study explores. Thus, the purpose of this qualitative, exploratory case study was to examine the perceptions of the parent stakeholder group regarding the involvement of their children in a one-to-one laptop program at two large, urban secondary schools in the southwest United States.

Educational technology in schools requires significant public and private funding with high, long-term sustainability costs (Hur, Shannon, & Wolf, 2016). Public support is critical to the funding of nationwide future educational-based technological initiatives. Without outside financial contributions, in other words, technology would be unable to

make its way into the classroom. The problem is that the attitudes of all stakeholder groups, with regard to this phenomenon, have not yet been studied specifically. The lack of research concerning the perspectives of the parent stakeholder group, in particular, has yielded mixed perceptions concerning its adoption into the educational setting.

Foundations for this study were discovered in empirical research studies on teachers (Nikolopoulou & Gialamas, 2015; Wang, Hsu, Campbell, Coster, & Longhurst, 2014) and students (Ardies, De Maeyer, Gijbels, & Keulen, 2015; Vaughan, 2014; Westerman, Daniel, & Bowman, 2016) at all different levels of education, from elementary (Fabian, Topping & Barron, 2016; Periera, 2016; Thys, Verschaffel, Van Doreen, & Laevers, 2016), secondary (Robinson, 2016; Tallvid et al., 2015) and postsecondary (Devlin & McKay, 2016; Mouri & Arshad, 2016; Torres-Diaz et al., 2016). Theoretical foundations were found in Rogers's (2003) diffusions of innovations theory that helped to lay the foundation and framework for this study.

Scholarship on key stakeholder groups' perceptions toward using digital technology in schools has focused on students, teachers, and administrators since 2013. Researchers have used quantitative methods to study the effects of gender on use of technology (Jaradat & Faquih, 2014) as well as self-efficacy and the barriers to adopting new learning technologies (Buchanan et al., 2013). Few studies have used qualitative methods to study the perspectives of parents (Bate, McNish, & Males, 2013). This research provides more insight into the perceptions of the parent stakeholder group regarding the involvement of their children in educational technologies, particularly that of a one-to-one laptop program.

The chapter includes a discussion about the literature search strategy that was used to find current literature, as well the theoretical framework—Rogers's (2003) diffusions of innovations theory—that was used to guide this study. The literature review focuses on scholarship about the attitudes of different stakeholder groups regarding technology in public, including the K-12 education stakeholder groups, younger generations, and older adults, as well as the differences amongst genders, socioeconomic and cultural influences, academic stakeholders, educators, students, and parents. This information follows with a discussion about barriers to the use of digital technologies in schools, which includes general barriers, resources, support, infrastructure, and teachers' self-efficacy. The chapter concludes with a summary that describes themes across the literature and offers an introduction into the following chapter about the research method.

Literature Search Strategy

Electronic databases helped to identify dissertation papers, journal websites, and reference lists of relevant journal articles. The electronic databases used include ProQuest Central, EBSCO Host Academic Search Complete, EBSCO Host Education Search Complete, Sage Premier, and ERIC. Google Scholar was also used to supplement the databases, but due to its lack of advanced search features it was not used as a primary search tool. I used several inclusion and exclusion strategies to find current literature that is appropriate for this study and will allow me to understand the topic of perceptions and attitudes toward the use of digital technology and their theoretical foundations. For the primary search databases, the advanced search feature was used to restrict the dates of the articles to the past five years from the time when this research study was first established,

as well as only articles that have been peer reviewed. English was chosen as the only language, but searches were not restricted to specific countries or regions. Only articles with full text PDFs were selected to be included in this literature review.

At the beginning of the search process, the following keywords were used to gather a wide range of articles related to the study: *education, achievement, adoption, technology,* and *attitude*. I used Zotero as a tool to organize the relevant articles found and its built-in features were used to view the tags associated with each article. This tool enabled me to find more search terms to use in combination with the first set of keywords. These search terms included *demographic, self-efficacy, parent, digital, social change, diffusion of innovation, motivation, computer, laptop, tablet, mobile learning, online, instruction, perception, information technology,* and *acceptance*. Several themes emerged when I explored and analyzed the first set of journal articles and this led me to further exhaust the literature by adding additional keywords to complement the search: *race, gender, ethnic, minority, socioeconomic, older people, older persons, senior citizens, age, youth, teacher, student, culture, adult, faculty, children, adolescent, parent, mobile learning, internet use, cyber bullying, and iPad*. The following section provides an in-depth discussion of the theoretical framework that guides this study.

Conceptual Foundation

Rogers's (2003, 2010) diffusions of innovations theory serves as the conceptual framework for this study. According to Rogers (2003), *diffusion* is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (p. 11). This theory is rooted in anthropology,

sociology, and epidemiology, and uses the premise that new practices and ideas spread through interpersonal communication (Valente & Davis, 1999). The theoretical foundation of the diffusions of innovations theory can be traced back to the studies of Gabriel Tarde in 1890 (Kinnunen, 1996). Tarde did not use the term *diffusion*, but he was the first to associate the rate of an innovation's adoption with an S-shaped curve and identify the role of social influence on how users reject or continue to use that idea.

Rogers's (2003) diffusions of innovations theory originated from a study about rural sociology in the Midwest United States in the 1920s and 1930s (Valente & Rogers, 1995). This study explored the growing agricultural technologies and the phenomenon of farmers adopting new equipment, innovative techniques, and hybrid seeds. Researchers Ryan and Gross laid the foundation for Rogers's (2003) diffusions of innovations theory in a 1943 publication that studied the diffusion paradigm in which social contacts, interaction, and interpersonal communication were crucial influencers regarding the adoption of new behavior. This notion led to several hundred studies throughout the 1950s and the 1960s that examined the diffusion process in many different contexts and situations (Rogers, 1995). According to this theory, the adoption of technology for use by an individual is generally perceived as the first step to diffusion and the acceptance of the innovation (Wang, Redington, Steinmetz, & Linderman, 2011).

Peres, Muller, and Mahajan (2010) suggested that diffusion is the process by which new products, technologies, and services is penetrated through the market and is propagated by social influence. Eveland (1986) proposed that technology that technology itself is not able to be diffused, it can only be evaluated from a phenomenological view

that is explained by its practice and uses. The diffusion of technologies has been evaluated using S-curves of adoption patterns over time typically revealing rapid adoption over the last half of the 20th century in almost every indicator of social conditions, environmental health, personal health, and social services (Moore & Simon, 1999). The data from these gains can serve as a forecast for future innovations by looking at the rates of adoption and suggests that its diffusion will continue to increase.

Types of Adopters

Rogers's (2003) diffusions of innovations theory explains that adopters of innovations fall into five categories with percentages of adopters based on the bell curve: innovators (2.5%), early adopters (13.5%), early majority adopters (34%), late majority adopters (34%), and laggards (16%). According to the theory, innovators are venturesome and almost obsessed with possibility of new ideas. They are considered risk-takers and understand the uncertainty involved with being the first to adopt a new idea. Setbacks are common when using new technologies, but the innovator is resilient and plays an important role in the diffusions of innovations. In contrast to the innovator, the early adopter seeks networks within the local social system. This category of adopter has the highest degree of opinion leadership and serves as a source of advice and information for others. The early adopter typically assumes the role of mentor in the diffusion process and helps trigger the critical mass that is necessary to promote sustainability. Critical mass is the point after which further diffusion, among a group, becomes self-sustaining.

Following innovators are the early majority adopters who are characterized as deliberative in making decisions with little or no leadership qualities (Rogers, 2003).

Within a social system, the early majority adopters above the average adopter on the innovativeness bell curve, which makes them a key member in the diffusion process. As the early majority adopts an innovation, critical mass occurs when the adoption rate quickly spreads across the remaining adopter categories. The early majority adopter may deliberate for a while before experimenting with new ideas and look to the innovators and early adopters for guidance and support. Late majority adopters are skeptical, uncertain, and deliberate as they experiment with new ideas. This category represents about one-third of all adopters and generally adopts a new idea just after critical mass is reached. Most in a social system must first adopt an innovation before the late majority feels that it is safe to experiment with a new idea. Peer pressure, economic necessity, sufficient guidance, and support are all factors that can influence the late majority to adopt.

Laggards are the group most resistant to change (Rogers 2003, 2010). As the most traditional members of a social system, the laggards are the last to adopt an innovation. They are not leaders, may be isolated within the social network, and typically have more conservative values. The innovation-decision process is typically long and drawn out for them because they do not like to take risks. Almost an entire social system must fully adopt an innovation before the laggard will consider joining and experimenting with a new innovation.

The situations upon which the diffusions of innovations theory were built upon are different from those in the educational setting (Januszewski & Melenda, 2013). Case studies used to substantiate this theory have generally been based on individual adoption of a technology outside a workplace for self-benefit. For example, Khlat, Pampel,

Bricard, and Legleye's (2016) thirty-five-year longitudinal study of the diffusion of smoking reported that the diffusions of innovations theory works well with explaining how smoking becomes a habit, but not for it being rejected with high and low education groups forming different stages. They found that the lower educated demographic group does not fit well within the diffusions of innovations theory model and that other theories need to be developed to understand this phenomenon. In a classroom setting, however, educational attainment is constant and a teacher, curriculum, or academic mandate tend to require collective decisions and the individual does not decide to adopt alone or with little outside consequence. In the proposed study, the diffusions of innovations theory will be applied in a setting that is not necessarily self-directed, but involves participants who may come from a wide span of educational backgrounds. The focus on relative advantage of parents as a social group aligns with the study's objective of understanding how a specific stakeholder may impact successful adoption of a laptop innovation.

Stages in the Innovation-Decision Process

According to Rogers (2003, 2010), the innovation-decision process brings an individual through the process of initial exposure to a new idea to making a final decision of whether to adopt the technology. A distinct part of this process is that an individual may experience feelings of apprehension and uncertainty while deciding to use and interact with the newness of adopting an innovation. The decision to adopt a new idea is not an instantaneous action or an impulse. Regarding the innovation adoption process, Rogers coins five stages that take place: knowledge, persuasion, decision, implementation, and confirmation. The first stage, knowledge, occurs when an individual

first becomes aware of a new idea or innovation and is exposed to its existence and functions. The second step, persuasion, occurs when a favorable or unfavorable attitude is gained upon the decision to experiment with the innovation. The third step, decision, occurs when the individual adopts or rejects the innovation. The fourth step, implementation, occurs when an individual chooses to mobilize the new idea from conception to use. The fifth and final step, confirmation, occurs when an individual reflects on the decision to implement the innovation and may choose to cease implementation if there are conflicting messages regarding the innovation. An individual will positively confirm further use of the innovation if the decision to adopt is reinforced. This step may require months or years before the individual is able to see significant benefits from an innovation, and confirmation may be even more drawn out for some of the adopter groups, namely the late majority and laggards.

The Diffusion Process

The diffusion process begins with early adopters acting as change agents in a society (Januszewski & Molenda, 2013). The adoption of an innovation by an individual or a group of people can result in the expanded adoption by other groups of people, and the unpredictability of an innovation's consequences is one crucial type of uncertainty in the diffusion process (Rogers, 2003). A new idea or innovation that is compatible with social norms will be adopted much quicker than one that is inconsistent with existing values and does not meet the needs of potential adopters. Moreover, a new idea will be slower to adopt if it is complex and requires an individual or society to learn new skills, change their way of life, or create new understandings. When a new idea can be tried

without an individual taking too much of a risk, the adoption of this idea will be considered at a much higher rate than one that carries the possibility of failure or threat. An individual is more likely to adopt an innovation if this person observes others successfully using it.

Not all innovations are considered equal, however, and their rates of adoption across a social network may vary (Rogers, 2003). For this study particularly, relative advantage is a critical concept. There is a relative advantage among different innovations, and economic factors, social prestige, convenience, and satisfaction all play roles in the degree to which an innovation is adopted. An innovation's rate of adoption is influenced more by its perceived benefit than its actual value or real contribution to the individual. An example of this can be found in the value of affective advertising for an innovation that shows someone is happier and more successful just by using the product. This is an example of a marketing technique that may convince consumers to adopt the new technology even if it does not actually yield the same results. The perceived value by parents is core to understanding their shared perceptions about the one-to-one laptop initiative.

Diffusion of Innovation in K-12 Education

Roger's (2003) diffusions of innovations theory has been used to explore and examine innovations in K-12 education as a strategy to better understand how adoption processes work when new technologies are introduced. For example, in the largest technology rollout in the nation's public education system, the Los Angeles Unified School District (LAUSD) school board approved a $1 billion-dollar plan to provide all its

more than 600,000 students with an iPad (Dobuzinski, 2013). Dobuzinskis explored Rogers's (2003) stages of the diffusion process in the context of a technology adoption project in Los Angeles public schools. Dobuzinskis collected data from 2011 through 2012.

Dobuzinskis's findings rejected Rogers's stages, because he found that the persuasion stage occurred after the decision stage in this particular case. Dobuzinski suggested that when external decision-makers are involved, the decision stage needs to be rethought and parents need to be brought into the decision-making processes. The rejection of the use of iPads started during its pilot phase, which consisted of 25,000 student participants, when it was discovered that nearly 300 students bypassed the iPad's security protocols and could access social networking sites and other websites that were initially blocked. As a result, the superintendent changed the existing policy and prohibited students from taking the iPads home, while many principals discontinued the program entirely and collected the iPads from the students.

In a subsequent study that examined several one-to-one laptop initiatives in schools around the world, Zhu, Shi, Wu, Yang, Wang, and Kwok (2014) found that an unintended result of the iPad technology rollout in Dobuzinskis' (2013) study of LAUSD was that the acceptance and attitudes toward technology use in the classroom was challenged by its perceived lack of usefulness by teachers, parents, and administration. The authors were convinced that Rogers's (2003) diffusions of innovations theory as well as the technology acceptable model (TAM) could be used to explain that there was no relative advantage for this group of people to further decide to adopt this innovation in

their schools. In this case, Roger's concept of relative advantage may have been core to the acceptance of the innovation.

Several studies have demonstrated that students who use one-to-one digital devices as an integral part of their educational experience ultimately benefit from the experience, in both their learning outcomes and their engagement in school (Crook, Sharma, & Wilson, 2015). Decision makers are often forced to make choices about allocating millions – and sometimes billions – of dollars toward digital technology initiatives in schools with only weak and limited evidence (Reid, 2014). Regarding the current study, the success of technological initiatives in schools is dependent on Rogers's (2003) adoption premises, as well as the information supported by his diffusions of innovations theory. If the marriage of technology and education is to be approved by stakeholders, namely the parent stakeholder group, there is a greater likelihood for technologies to be approved in the urban schools involved in this study.

Diffusion of Innovation for This Study

There are four main components required for the diffusion of an idea: the social system, time, communication channels, and the innovation (Januszewski & Molenda, 2013; Rogers, 2003). For this study, the innovation is the one-to-one laptop program at two high schools with approximately 2,600 students each in the same urban public school district in the southwestern United States. The schools and their members define the social systems that were examined in this study. The timing of the innovation was a factor of the duration of the project, at the time of the study in its third year, and the schedule for laptop distribution which occurs at the beginning of the school year and

recollected at the end of each spring term. Students used their computer at school, as well as at home. Students who did not have parental permission to take their laptop home were required to check their device in and out at the school's administrative office. In the context of this study, the communication channels were defined as parent-parent, school-parent, and parent-child. The interaction between these social groups may have occurred via parent meetings, newsletters, trainings, formal discussions, informal conversations, parent organizations, and other means of communication.

The studies reviewed in this section indicate that an innovation, such as the introduction of a one-to-one technology program in a school, can have barriers toward its adoption that are not necessarily expected or directly related to its intended use. In the case of the LAUSD iPad program (Dobuzinskis, 2013; Zhu et al., 2014), the acceptance toward technology use in the classroom was challenged by its perceived lack of usefulness by teachers, parents, and administration. Rogers's (2003) concept of relative advantage helps to explain the reasoning as to why some population groups are more reluctant to adopt a positive attitude toward the use of technology in schools. The scholarly information presented may provide insight as to the reason why the rate of diffusion of the technological innovation of one-to-one laptop programs has not been fully approved by the parental stakeholder group. Parents' attitudes toward technologies in the classroom were explored throughout this study, focusing on the relative advantage perceived by the group rather than the individual rate of adoption. As influential stakeholders who exert influence over students' use of technology outside of school, parents' perceptions of relative advantage may reveal indicators relating to acceptance.

A qualitative exploratory case study methodology assisted in conceiving what is currently unclear regarding relative advantage (Rogers, 2003) and educational stakeholders, specifically parents. The research question explored a complex facet of technology adoption as perceived by parents' perceptions that not only can have positive and negative effects on the students, but also on people within their social networks (Rogers, 2010), such as teachers, staff, and administrators. In this context, this theory is most appropriate to frame the study, as it served to explain how populations collectively come to adopt new innovations rather than the individual rate of adoption.

Summary

The literature regarding Rogers's (2003, 2010) diffusions of innovations theory reveals several commonalities. First, several studies have demonstrated that students who use one-to-one digital devices as a part of their educational experience benefit from the experience (Crook, Sharma, & Wilson, 2015). These benefits can be seen in their motivation towards school and in their improved learning outcomes. Also, relative advantage had an impact on the diffusion an innovation such as the implementation of a one-to-one digital device program in the classroom. This innovation was challenged by its perceived lack of usefulness by teachers, parents, and administration.

While diffusion can be exemplified in the processes by which new products, technologies, and services is penetrated through the market and is propagated by social influence (Peres, Muller, & Mahajan, 2010) and can act as a forecaster for future innovations (Moore & Simon, 1999) it is unclear how parents are influenced by the innovation itself by virtue of their own state of adoption. The innovation-decision process

brings an individual through the process of initial exposure to a new idea to the final decision of whether or not to adopt the new idea, which is not the focus of this study. It is a parent's perceived relative advantage that was core to this study as it becomes critical when an innovation's rate of adoption is influenced more by its perceived benefit rather than its actual value or real contribution. Rogers's diffusions of innovations theory provided insight as to the reason why the rate of diffusion of the technological innovation of one-to-one laptop programs has not been fully approved by the parental stakeholder group.

Foundations in the Literature

I examined foundations in the literature in this section to provide the depth and breadth of knowledge regarding the interactions of technology with society. The adoption of technology is subject to the attitudes, abilities, and technological capacity of users (Young, Willis, Cameron, & Geana, 2014). The world of the 21st century has embraced technology, yet the global educational environment has lagged. There exists a need for 21st century students to have an educational experience that prepares them for a future of unpredictability that is immersed in technology (Prensky, 2012) and, for this study, the focus on parents' perceptions toward a one-to-one laptop program addresses the priorities of using technology to support learning in the classroom and at home. The importance of technology in the classroom continues to increase, but successfully infusing it into the curriculum is both a challenging and complex process (Reid, 2014), including how educational technology is used outside the classroom.

This section is an exploration and examination about the scholarship regarding the attitudes of several stakeholder groups who have a vested interest in and influence over how digital technology is used inside and outside of the classroom. These stakeholder groups include teachers, principals, parents, and students (Jordan, Chrislip, & Workman, 2016; Rosa, 2013), each of which is part of decision-making processes regarding the use of technology for school age children. The review also explores scholarship about the role of age, gender, socioeconomic status, and culture in influencing the attitudes and opinions of stakeholders. The literature review also studies the barriers toward implementing educational technology in schools, such as resources, support, infrastructure, and self-efficacy (Dutton & Blank, 2014).

The cited research includes both national and international studies that were predominately conducted from the year 2013 to the present day. The secondary schools used in this study have large populations of students who speak over 95 different languages and represent some of the most diverse schools in the United States. Technology integration in schools is also not unique to American schools and is found in schools at all different levels around the world (Vahtivuori-Hänninen & Kynäslahti, 2016). To saturate the literature and aim to provide breadth and depth, literature was not restricted to studies from the United States. The studies involved teachers, students, and parents of both genders and of varying grade levels, to provide a thorough perspective. The studies cited include information that supports the use of technology in schools, as well as information so why stakeholders may remain opposed to adopting technology in schools via data collected from various stakeholder groups.

Perceptions about Technology: Key Stakeholder Groups

This section presents a review of literature that explores various education stakeholder demographic groups and includes a variety of mixed-methods, quantitative, and qualitative studies that examine attitudes and perceptions toward using technology within an educational environment, at home, at work, and in other societal contexts. There are several stakeholders who are affected by policies, regulations, and funding in schools, from prekindergarten through postsecondary education (Rosa, 2013). The demographic groups that are of focus in this literature review are older adults and younger adults, along with studies related to gender and educational stakeholder groups including teachers, students and parents who make decisions about the funding of technological initiatives, the adoption of curriculum that offers digital resources and the policies that encourage teachers to link to students and parents through learning management systems, such as Edmodo™ or Schoology™. The attitudes of individuals and demographic groups regarding the use of technology, both inside and outside the classroom, is important to study (Rana, 2016). Without stakeholder support and involvement, change becomes a challenging effort and transformational projects such as technology programs in schools will face many obstacles and barriers (Salas, 2016).

Older adults. According to Damadoran, Olphert, and Sandu (2014), the demographic of people over the age of 60 is expected to grow to one-fifth of the world's population by 2050. The growing older adult population was the focus of a study conducted by Damadoran et al.'s (2014), which explored how older adults use technology and which factors can affect their use. The researchers conducted a mixed methods

approach, collecting both qualitative and qualitative data via a survey of over 300 older adult technology consumers. The results of the study unveiled through bivariate and multivariate quantitative analyses and inductive and thematic qualitative approaches that older adults perceive technology in a positive manner and are frequent consumers, however, they also cited challenges, which include technological complexity and a lack of learning materials to assist older adults with adapting to changing technologies.

Researchers Young et al. (2014) also studied the relationship between the older population and technology by conducting a qualitative case study to explore barriers to their adoption of technology in the home health care sector, particularly accessing personal health records electronically. The researchers conducted in-depth interviews with 35 American adults between the ages of 46 to 72 to understand their attitudes toward these technologies. They used open coding to analyze the data and find patterns as well as unique features to explore the barriers toward the participants' adoption of technology. The results were similar in nature to that of Damadoran et al. (2014), signifying that low adoption rates of technology by older adults is not necessarily related to lack of interest, not having access, or having low skills, as, in 2013, more than 50% of Americans at the age of 65 and older claimed using the Internet (Young et al., 2014). However, the older adults cited discomfort with the technologies, discussing privacy concerns, perceived lack of relative advantage, and an impersonal representation of themselves.

The use of computers by the elderly is similar to that of younger groups, but the decision to adopt was based more on usability, utility, and if there was a perception that it would enhance the quality of their life. This is in accord with Rogers's (2003) diffusions

of innovations theory, which states that lifestyle becomes an important predictor of technology adoption, because people seldom adopt new technologies solely for practical contributions (Rogers, 2003). Young et al. (2014) found that the adoption of technology among older adults falls under four themes: discomfort with the use of technology, concerns with personal privacy or security, minimized personal gain or relative advantage, and lack of relevance. Technological discomfort, in particular, was found to be a major hindrance to technology adoption and an unappealing quality. Initially, many of the participants had negative views toward digital computing and said it was too vast, unappealing, lawless and insecure for the exchange of personal and private information. Even though most of the respondents regularly used email for communication, they remained skeptical about the safety and privacy of their personal information. Many of the respondents vocalized feelings about their computer being a burden, both complicated and a hassle. Overall, according to this study, there was a sense that older people believed they would use technology more often if it was user-friendlier and did not require constant learning. Damadoran et al. (2014) supports the notion of older adults experiencing difficulties with the diffusion of technology, and personal adoption, as older people may now be at more of a social and economic disadvantage, as businesses and governments are increasingly offering services online.

According to researchers Young et al. (2014) and Damadoran et al. (2014), older people have been slower to adopt technological advances than their younger counterparts. Damodaran et al.'s mixed-methods study cited above found that many of the participants demonstrated advanced use of digital skills and used their computers and digital devices

for a wide range of purposes, including photo storage, social networking, seeking information, and managing travel-related information. Older adult respondents mentioned that part of their desire to learn and use technology was to "keep up with the times" and "to be able to communicate with family members and friends." According to Damodaran et al., nearly 80% of the participants used their mobile smartphones and 70% used their computers on a daily or frequent basis. According to Rogers (2003), these results would signify that older persons have reached a critical mass in the adoption of digital technology and that further rates of adoption will be self-sustaining. Despite some of the aforementioned hesitance regarding the commonplace use of technology, the older generation has begun to assimilate technology into their daily lives, according to this research.

Young et al. (2014) found that older persons gained satisfaction when they overcame obstacles of technology use and improved in their ability to intuitively solve their technology problems. Older people processed information just as well as their younger counterparts, but they worked at much slower paces. Older persons typically did not initiate the purchase of digital technology or learn how to use it on their own. Instead, they looked to the behaviors of other populations within society to understand the growing trends and/or new innovations. These older persons represented a category called "helped adopters," who have family members or friends that aided in the purchase and set up of technology and provided training and technical assistance. This group experienced a high degree of discomfort in technology use and required help and support

to adopt and achieve certain technology goals, but they were unlikely to use the Internet for more than practical means.

In a descriptive qualitative case study, researchers Boström, Kjellström and Björklund (2013) found that older persons had a great desire to remain as independent as possible as they navigated through life. These researchers conducted a qualitative study of 45 seniors, ages 67 to 97, and living in retirement homes across Sweden, to identify and describe the attitudes of older people toward using technology to monitor their health. Like the findings of Young et al. (2014) which claimed that older people were concerned with privacy and security, Boström et al. (2013) used the coding of interview transcripts to find that seniors were most concerned with keeping their lives private and maintaining a sense of freedom and independence. In efforts to understand the perceptions of older adults toward new technologies, Boström et al. asked their participants about their thoughts toward using wearable technologies to detect their position, heart rate, and body temperature as a health and safety monitoring system. According to the findings, the participants stated that they would exchange some of their privacy for increased access to services and communication with their health care providers, if they maintained control of the system, as well as a sense of self. When related to Roger's (2003) diffusions of innovations theory, this study suggests that this group of individuals – the older adults – would be at the end of the decision stage and ready for the implementation stage. According to this theory, this is the point in which the older adults would be willing to go beyond conception and move toward experimentation. Older people fear that they will be treated as a number based on

monitoring technology. However, while this study indicates a positive appreciation for the affordances of technology, it is unclear how many of these older adults used the wearable technology in their personal lives.

A recurring theme that emerged from all the studies regarding older persons and their attitudes toward digital technologies is that new technologies offer the opportunity for communication with people regardless of time and place. Abad's (2013) study of media literacy concerning the older population in Spain offers a converse perspective. According to demographical research studies, 85% of older adults ages 65 to 74 were not connected to the Internet and, consequentially, were not technologically literate (Abad, 2013). This information greatly differs to that of the United States, where, according to the Pew Research Center, more than 50% of adults over the age of 65 were connected to the Internet (Internet/Broadband Fact Sheet, 2017) just a few years later. However, it certainly provides insight as to the worldwide rate of diffusion regarding technology amongst the older population, and the notion that technological diffusion certainly varies from culture to culture.

According to Abad (2013), an increase in aging populations suggests that there will be significant changes to the technological, social, and economic makeups of countries around the world. With increasing life expectancies and lower birth rates, the elderly population can reach as high as one-third of the entire population in some regions, and to bridge the generational digital divide, there must be a growing concentration of operational skills rather than solely usability and access. Moreover, regardless of the generalizations made toward a population, motivation also has a significant role in an

individual's choice to learn about and experiment with new technologies (Rogers, 2003). According to Rogers's diffusions of innovations theory, ability and motivation significantly influence a potential adopter's motivation to make the adjustments needed to adopt an innovation. Furthermore, according to this theory, elderly people will actively seek out opportunities for advice, support and training with an increased motivation to learn about new technologies, if they possess the desire to do so.

Younger adults. In the context of this study, the younger adults in question comprise the millennial generation. According to a research study of scholarship concerning the millennial generation, DeVaney (2015) refers to this population as ages between the ages of 23 and 35 that makeup the youngest members of the workforce. On the other hand, according to the Pew Research Center, millennials are recognized as adults between the ages of 18 and 34 years old (Fry, 2016). For the purposes of this study, the millennial generation in question will refer to 18 to 34-year-old age group recognized by the Pew Research Center. According to DeVaney (2015), millennials have been considered digital mavens, both vastly familiar with the range and capabilities of technology for both professional and personal purposes. Their role in the diffusions of innovations is significant, as millennials were, at the time of the study, the largest living generation in the United States with more than 75.4 million members (Fry, 2016).

In efforts to discover how attitudes toward digital technology differences between the Millennial generation and Generation X (adults between the ages of 35 and 50 years old), Kubiatko (2013) collected 200 responses from participants between the ages of 17 and 23 and 66 responses from participants between the ages of 24 and 57. The

participants were based in Eastern Europe and were either students or teachers from both urban and rural areas. Although the locality of the participants differs to that of the United States, the insight provided from the responses may indicate universal trends in the behaviors of these generations toward the assimilation of new technologies. The responses were collected via a self-constructed questionnaire regarding demographics and either dichotomous (yes/no) or like-scale questions concerning the use of technology and the Internet and methods of inductive statistics including Analysis of Variance (ANOVA) were used to analyze the data. This mixed-methods study found that attitudes of the millennial generation demonstrated a greater favoritism toward everyday technology use than generation X. Moreover, Abedalaziz, Jamaluddin, and Leng (2013) found that millennials are also faster learners regarding technology when compared with generation X.

Abedalziz et al. (2013) also measured the attitudes of post-graduate students toward digital technology use, both in academic and for personal use. The researchers surveyed 289 postgraduate students from a university in Malaysia using two instruments, the Computer Attitudes Scale and the Internet Attitudes Scale, to assess their attitudes toward digital technology usage. The participants, who included 155 males and 134 females, represented a wide range of majors with a mean age of 31. The quantitative data was analyzed using mean scores and deviations to find that the participants felt comfortable using digital technology and maintained positive attitudes toward its use. One of the significant findings was that age played a major role in determining the participants' attitudes toward computer and Internet usage. Thus, the age of the

participant was inversely correlated with their attitude toward digital technology use, thus signifying that younger persons are more likely to provide support and find usefulness in using new learning technologies than older people. It must be noted here, that millennials were presumably more comfortable with the use of technology because members of the generation were raised during a time where technology in the United States was becoming more commonplace (Prensky, 2012). The same cannot be said for their older generational counterparts, who have had to adapt more to the presence of technology, rather than experience a childhood surrounded by its presence. Due to the knowledge of millennials with regard to technology, along with their vast size in the United States, this generation can also act as change agents in this country, influencing the attitudes of the generations surrounding them regarding technology (Kubiatko, 2013).

Gender. The studies cited concerning the differences in gender regarding the adoption of an innovation are mixed. According to Gupta (2015), there exists a stereotype in some cultures, such as the United States, which suggest that professional technological vocations are masculine and specifically designed for males. However, the relationship between digital technology and gender is not static and can vary depending on socio-cultural and economic contexts. Gupta found that women have increasingly begun working in computer-related fields, such as computer science and engineering, in the developing world. This perspective relates to Rogers's (2003) diffusions of innovations theory, which can explain this phenomenon in the disparities of men and women interested in careers that involve technology. According to this theory, Rogers states that relative advantage is the degree to which an innovation is perceived to be useful. In the

western world, there is a relative advantage, or stereotype, that in a professional setting, males are better skilled with computers than females (Gupta, 2015). According to Gupta, in developing countries like Malaysia, women have dominated the field of computer science and computing has been a women-friendly profession, with males largely uninterested in competing for these types of jobs. This notion demonstrates that gender does not determine one's ability to use technology, but rather society's perception of ability influences the adoption of an innovation.

Researchers Jaradat and Faquih (2014) believe that the adoption rate of technology in the developing world is relatively low and there exists a need for studies that can provide further insight into how to understand and accelerate it. The researchers used a quantitative study and theoretical research model centered on the Technology Acceptance Model 2 (TAM2). The TAM2 was used to explore and examine the influence of self-efficacy and gender on the adoption process of different new payment technologies in Jordan. The study used 400 participants from several Jordanian universities with a survey that was collected using a stratified random sample approach. The gender of the participants included 50% female and 50% male. The study was restricted to college students because they are more likely to be avid and savvy users of technology than other potential groups. Jaradat and Faquih found that gender had little effect on whether the participant decided to adopt a new payment technology and that the deciding factor for its adoption was predominately self-efficacy. This finding, the notion that a benefit or relative advantage must be in place to increase the rate of adoption,

correlates with Rogers's (2003) diffusions of innovations theory, which states that the greater the perception that an innovation is advantageous, the quicker its rate of adoption.

In contrast to Jaradat and Faquih (2014), Hohlfeld, Ritzhaupt, and Barron (2013) found that female students demonstrated more positive attitudes and higher skills in technology use over their male counterparts. In a study that included over 1,000 middle school students from 40 different schools in several different districts across the southeastern part of the United States, a t-test statistical analysis was used to examine gender related to communication and information technology literacy. Females were found to have statistically higher levels of computer use, higher perceived digital technology skills, and more positive attitudes toward computers than the males in the study. These results were opposite from many studies that show the opposite outcomes where males were found to perform better with technology skills and had overall better opinions and perceptions toward computers and digital technology (Hohlfeld et al., 2013). According to Rogers's (2003) diffusions of innovations theory, the diffusion process begins with early adopters acting as change agents. These studies demonstrate that younger females are adopting technology at a higher rate and Rogers's (2003) theory suggests that the trend is that females of earlier generations are approaching and even overcoming the adoption levels of their male counterparts.

Researchers Brimacombe and Skuse (2013) explored gender and information and communication technologies (ICTs) with regard to development. They analyzed various international ICTs indicators, which are used to counter the access to, and use of, said ICTs. The scholarship cited discussed the slow-paced nature of gender-specific

integration, in addition to material about how gender specificity can be taken into consideration on behalf of ICT developments. The past has been slow to incorporate gender sensitivity within program design in information and communication technologies, but they found that gender sensitivity could be practically integrated into the development of new initiatives. The researchers believed that companies could consider gender specificities in their policies, which can further contribute to better technological integration on behalf of both genders. Conversely, however, the findings of Hohlfeld et al. (2013) indicated that gender was becoming less significant in terms of technology usage.

Educators. Teachers make choices every day concerning their teaching approaches, tasks, and the technologies they will use to provide rich learning experiences for students. There are many factors that influence a teacher's choice about the curriculum, how it is used with the students, and how student learning is assessed and evaluated. Aubusson et al. (2014) studied teachers' perceptions of how the role of tasks using technology can affect student preparation, enjoyment, learning, and overall lesson choice. In this context, "rich tasks," according to Aubusson et al., were described as activities that are characterized as being authentic, interdisciplinary, relevant, resource intensive, reflective, and directed by student choice. This qualitative study used discrete choice modeling with 268 primary school teachers from across Australia. Most participants were female (88 percent) and from schools that ranged in size from 25 students to more than 100, with an average of 43 students. The participants completed a survey. Aubusson et al. found that teachers preferred lessons that incorporated a diverse

use of technology, were authentic and relevant to their students' lives, were performed in groups, included several resources, and incorporated teacher-designed assessments. Findings specified that teachers preferred rich task-oriented lessons even though the amount of preparation time and difficulty of delivery were increased compared to lessons that are less authentic and less relevant. Lastly, the researchers found that student enjoyment and increased learning outcomes were preferred and could positively impact teacher attitudes on using digital technology to deliver rich task lessons.

To better understand how the diffusions of innovations theory (Rogers, 2003) explains teachers' acceptance of the use of technology at the secondary level, Hsu (2016) surveyed 14 administrators, 37 teachers, and 1756 students at 13 high schools in Taiwan. The theory provided the framework for the survey which was uniquely designed for administrators, teachers, and students. These surveys included a set of statements in which responses were indicated on a five-point Likert scale. They included statements such as "Teachers are provided with opportunities to try the technology-integrated instruction" for administrators, "With the help of technology, I am more capable of helping students acquire knowledge about the subject matter" for teachers, and "I will have more channels to reach my classmates and the teacher when technology is being used in class" for students. Using a multilevel analysis, Hsu found that self-efficacy and expectancy positively affected how teachers used technology instructional purposes, but had no moderating effect on students' learning. Students' self-efficacy and motivation were found to be critical factors in creating positive learning outcomes, and without them no moderating effects were found even with increased spending on classroom technology

and increased use of technology in instruction by a teacher. This study showed that increased funding and use of technology in the classroom were not enough to improve student learning outcomes. In order for technology programs to be successful in school, students need to be motivated and have the belief that technology will help them succeed particularly when endorsed by adults who support learning.

Mitchell, Parlamis, and Claiborne (2015) studied the process of school faculty's acceptance of online learning. The researchers applied the transtheoretical model of change to understand the sources of resistance and presented suggestions as to dissolving the resistance. Mitchell et al. found that the use of technology in academia was precipitated by the increase in ownership of personal computers, ease of use of the Internet, improvement in technology and accessibility, and increase in demand for using educational technology. Even though the adoption of educational technology has been steadily increasing, there are teachers who remain resistant to the shift to using online learning systems. According to Rogers's (2003), this group of teachers would be considered laggards who are the last in a social system to adopt an innovation and tend to be resistant to change. Mitchell et al. (2015) stated that change has been slow in the university classroom and it has been met with conflict and ambivalence regarding the use of digital technology.

Many educational institutions require teachers to use an institution-wide system rather than allowing them the flexibility to decide their own methods and modes of transmitting their curriculum to students (Buchanan et al., 2013). In an online survey conducted at a university in the United Kingdom, Buchanan et al. examined 114

professors in a quantitative study designed to measure Internet self-efficacy and the barriers to adopting new learning technologies. In this study, 43.9% of the respondents were male and 56.1% were female, while the mean age was 47.9 years old and the average hours per week spent on the Internet was 23.77 hours. Participants were asked to indicate the extent to which they felt comfortable performing Internet-related tasks, such as using online discussion groups and trouble-shooting technology related problems. A series of 15 items related to perceive barriers to technology adoption were also presented in which the participants were asked to respond using a five-point Likert scale. An example of one of these items includes the respondents' attitude toward using technology-enhanced learning methods in the instructor's subject field. Buchanan et al. found through a quantitative statistical data analysis that there were two main barriers toward adopting new learning technologies: perceived usefulness of the new educational technology tools and structural constraints within the organization, such as provision of resources and technical support. This notion was consistent with the findings of Aubusson et al. (2014) that teachers are bound by regulations, restrictions, and access to resources that can affect their ability to introduce non-traditional education tools, such as digital technology, into their classrooms. These studies suggest that there is a need for adequate provisions of digital technology and integrated support structures for new learning educational technology systems to be successful and sustainable.

In the United Arab Emirates, a specific program gave 14,000 first-year students in all three of its federal public higher-level institutions an iPad to use both in class and outside of school (Cavanagh, Hargis & Kamali, 2013). The goal of this program was to

boost the students' motivation and engagement while improving success in learning with the use of a single device to access course content, resources, and tools. The initiative also focused equally on the teachers as well by requiring a training session as to how to use the tablets, introduction to the available apps used for the program, and special attention to providing extra support for creating more challenge-based problems in the curriculum. Cavanagh et al. (2013) then analyzed the abstracts of 132 faculty members who shared their experiences and ideas about using the iPads to represent faculty attitudes and knowledge of teaching and learning in a technological environment. The researchers found that there was a significant difference in the number of faculty members who demonstrated that their attitudes toward using technology positively increased with the use of iPads and who believed they could substitute their traditional curriculum to one that was entirely available on the tablet. Thus, the results were mixed, demonstrating the teachers' beliefs that changes were necessary to the traditional curriculum in order to match the new technology. This also demonstrated that the faculty in question did not necessarily believe that increased use of tablets in the classroom setting directly influenced their perceptions regarding technology in general .

McKnight et al. (2016) used a qualitative case study to examine teacher attitudes toward the use of one-to-one digital device technology in seven exemplary secondary schools across the United States. Through the qualitative coding analysis of interviews, focus groups, and classroom observations, they found that teachers generally had positive attitudes toward using technology in the classroom because it allowed their students to go into depth, find up-to-date information, and participate even if they were absent. Teachers

also found that technology allowed them to differentiate and personalize the learning for individual students, especially those with learning disabilities or other at-risk factors. Teachers noted that a traditional classroom can be restrictive whereas an Internet connected classroom gives students choices and control in their learning process and helps students take responsibility in the learning process while instituting multiple pathways in the learning process. Teachers also found that technology increased their ability to communicate with their students and their families using modern innovations such as emailing, texting, and social networking. It also allowed them to facilitate feedback that was immediate and bidirectional, allowing them to reach their learning goals faster and more in depth. Teachers reported that technology changed the way that they work and manage their time. No longer were they just relying on face-to-face contact with their students, they were able to post assignments in real time at any time and incorporate many different forms of multimedia such as audio and video into their lesson plans.

In contrast to the findings of McKnight et al. (2016), Carver (2016) found that there are several barriers that can hinder technology integration by teachers in schools. In a qualitative study using an online survey, Carver studied 68 K-12 teachers to examine their attitudes toward their students' use of educational technology. Questions such as "What are some of the barriers you face in implementing technology into your daily classroom instruction?" and "What factors impacted the frequency and purposes for which your students use educational technology?" were asked in the questionnaire. Even though they found that increased engagement was the most frequently identified benefit

of using technology in the classroom with their students, teachers identified the availability of technology, lack of maintenance of current technology, and deficiency of teacher training as barriers that hinder their ability to successfully and effectively use educational technology in their classrooms.

The scholarship presented in this section suggests that educators majorly support the presence of technology in the classroom. However, the mixed results suggest there is also considerable room for improvement. In their respective studies, researchers Aubusson et al. (2014) found that teachers prefer lessons that incorporate technology, while McKnight et al. (2016) similarly found that teachers displayed significant positive attitudes toward using technology to assist in their teaching, to assist in the students' learning, and were comfortable with using the technologies in question. Carver (2016) revealed that teachers have a more positive outlook toward the use of technologies in the classroom if there was an increased availability of technology and formal training sessions were provided to faculty. Conversely, however, Mitchell et al. (2015) believe that change has been both slow-paced and met with conflict, while Aubusson et al. (2014) also argued that teachers are bound by regulation, restrictions, and access to resources that can affect their ability to introduce non-traditional tools. Despite the forward progression of teachers' perspectives toward and familiarity with using technologies in the classroom, there remains room for improvement (Carver, 2016; McKnight, 2016, Mitchell et al., 2015). These results collectively suggest that some teachers support technologies because they believe that it enhances the learning process. However, some

faculty remains convinced that technology poses confusion and detracts from the learning process instead of enhancing it.

Students. The K-12 students of today were raised in a society saturated with advanced technologies that have been pervasive in their everyday lives, both in and out of the classroom (Wang et al., 2014). This generation is referred to as the Homeland generation (those born after 2004), and includes middle school-aged students and younger (Wang et al., 2014). Students born after 2000 have witnessed the introduction of the iPod in 2001, iTunes™ in 2003, Facebook™ in 2004, YouTube™ in 2005, GoogleDocs™ in 2006, the iPhone™ in 2007, and the iPad™ in 2010. Students as stakeholders are on the receiving end of educational policies and guidelines that are determined by politicians, administrators, teachers, and the voting public.

Students' familiarity with technology has introduced new opportunities for both the students and teachers alike. One of the opportunities in question involve technologies for English Language Learner (ELL) classrooms to use as learning resources and tools to improve student achievement and facilitate learning English as a second language (Gustad, 2014). Students in ELL classrooms have been given the added task of acquiring new social and academic language skills as well as the content areas of their classrooms. A student's motivation to learn a language has proven to be a major indicator of success in their speed of learning an additional or second language. Gustad used a qualitative case study to study students participating in a fourth-grade ELL class by meeting with the students three times a week for 20-minute and 50-minute interval periods over the course of four weeks. The students were presented with a reading survey and then taught how to

create podcasts to document the process of writing fictional short stories. The students created podcasts during each session and then listened to them during the subsequent sessions to examine their own fluency and learning. The final step of the study was an interview with each student in which five prompts were discussed such as "Please describe your experience with podcasting" and "Has this experience with podcasting changed the way that you read out loud?" Gustad found through the coding of data that the use of podcasts in an ELL classroom positively impacted student reading motivation and an unintended positive result on student behavior. The implication of this research suggested that using a technology tool has the potential to improve literacy skills.

Ardies, De Maeyer, Gijbels, and Keulen (2014) support that technology is ubiquitous and that young persons are acutely interested in technology for their personal lives, but their opinions regarding careers in technology and education are not as positive. In a study that involved 2,973 secondary students in 17 Flemish schools in Belgium, two sets of questionnaires were distributed to measure five factors of attitude toward technology, such as boredom, difficulty, technology use as a career, and perceived consequences (Ardies et al., 2014). The findings of this study indicated a negative correlation between student attitude toward educational technology and time. Another finding of this study suggested that anxiety toward technology use in school decreased over time, which indicates that a more positive perception is formed as students begin using technology as an integral part of their school experience. These findings are like Wang et al. (2014) regarding students having more positive attitudes toward technology use outside of school rather than as an integral part of their classes in school. These

studies collectively suggest that although the initial use of digital technology in school may increase student motivation and engagement, the positive attitudes of students toward technology use in the classroom may decrease over time.

Parents. Parents are oftentimes the observers, watching their children navigate through a world that is deeply saturated with technology and their views can be at odds with those of their children (Hiniker, Schoenebeck, & Kientz, 2016). Although many parents use technology themselves, their ability, usage, and perceptions differ from that of their children, as is evidenced throughout this literature review. This difference in perception may stir disagreements or confusion over the role of technology in education and how technology can aid to a child. Although today's children are being raised in a world that is saturated with technology, the childhood of their parents did not share this presence.

According to Vittrup, Snider, Rose, and Rippy (2016), prior to the relationship between technology and education, children were exposed to standard learning and creativity tools, like scissors, crayons, and paper. These tools may resemble the tools commonly used by the parents of today's children, during their early academic experience. However, academic and entertainment technologies, like videogames, television, and computers, have been substituted for – and, in some cases, entirely replacing – these traditional educational tools (Vittrup et al., 2016). Vittrup et al. conducted a research study to understand parents' attitudes and perceptions toward their child's knowledge of modern technological tools. The survey involved 110 parents of young children (ages 2-7 years old) living in the United States, along with 39 children,

ages 3 to 6 years old. The results revealed that parents and children alike were heavy consumers of technology, and that parents predominately believed that technology – as well as the media – positively affected their children's development. Many of the parents even believed that parental controls and age-appropriate settings were detrimental to the academic development of their children.

Similarly, Pereira (2016) conducted a study about parents' perspectives toward their children's technology use, as well as their rules and regulations regarding technology, following a one-to-one laptop program that was launched in Portugal in 2007. This study administered a take-home questionnaire to 1,264 parents/guardians and 1,517 third and fourth grade students from 32 schools. The mean age of the parents/guardians was 39.5 with 65% of them between the ages of 35 and 45. Through a statistical analysis of the data, Pereira found that nearly all the parents (95%) believed that technology has a positive impact on their children's lives, and the frequent use of technology aided in students' learning processes. However, most of the parents also viewed the computer as an academic tool, rather than a gateway to entertainment, which, according to the research, is the actual use for most children. The parents shared concerns about their children's access to inappropriate content and growing dependency on technology, which, consequentially, subtracted time from healthier activities, such as playing outdoors or reading. With these threats in mind, 92% of the parents believed that computers should be used in schools for academic purposes, while 85% believed that students should be able to access the Internet at school for academic purposes. Conversely, less than 50% of parents believed that students should be permitted to watch

television, access social networks, play videogames, or use cellular devices during school hours for academic purposes.

Researchers Vittrup et al. (2016) conducted another study that investigated the perceptions of parents toward the role of media and technology in the lives of their young children. The participants included 101 parents of children between the ages of 2 and 7 living in urban communities in the southwestern United States. The participants ranged from 23 to 53 years old with the majority of Caucasian decent (83 percent) having had at least some college education (93 percent) and with a household income of about $75,000. Each parent submitted a survey, titled "Attitudes, Perceptions, and Decisions Related to Technology Use with Young Children," which was specifically developed for this study. Vittrup et al. found that both parents and children were heavy consumers of media in their own day-to-day activities. Most of the parents could not identify the technology proficiency level of their child and many children could not properly identify common media tools. Overall, most of the parents displayed a positive attitude toward their children's use of technology and they believed that exposure to technology is vital to their children's development. In contrast to Pereira's (2016) study of a one-to-one laptop program in Portugal, this study represented mainly educated middle- and upper-middle class parents (Vittrup et al., 2016). Both studies found that the more educated and professional the parents, the more likely they were to neglect their children's technology use in the home.

Plowman (2016) conducted a study to understand the learning experiences of young children in the United Kingdom, ages 3 to 4 years old, using toys and technology.

The study was conducted via a three-year project that was funded by the United Kingdom Economic and Research Council, which explored the behaviors and habits of children from seven families with regard to leisure and learning. The researcher used an ecocultural approach, which supports ethnotheories, or the notion that "beliefs about bringing up children are culturally shaped by many factors, including the caregiver's age, education, employment history and geographical location" (Plowman, 2016, p. 39). Findings indicated that various people could impact a child's technology use, including older siblings, parents, and relatives, such as grandparents and guardians. These older figures not only served to monitor younger children's technology use, but offered examples as to how much technology use is appropriate. However, household rules and regulations generally mimicked those from the childhoods of the parents, and because most adults in question were not raised with similar access to technology, they were unable to look to their childhood as a reference for its appropriate use. The parents in this survey, therefore, were required to start entirely from scratch when developing rules and regulations of which to guide their children's' use of technology. This demonstrates that although parents accept the presence of technology and their child's use of it, they are unaware as to the appropriate consumption of technology, in addition to the content that their children are exposed to in comparison to other children of similar age.

Johnson (2014) conducted a qualitative case study of six families in northern Utah, exploring how technology and electronic media consumption affects a child's relationship to reading. According to the findings, the routines and rules within the home were based largely on the parents' childhood experiences. The parents described the rules

as being implicit rather than explicitly written, and the rules differentiated based on the maturity levels of the children and their perceived needs. The most common rules regarding technology use focused on where technology can be used, how much time could be spent using it, and what was deemed appropriate, along with an emphasis regarding the balance between technological and non-technological activities. Parents admitted to struggling with managing their children's use of technology as an educational tool and as an entertainment device. Corroborating Pereira's (2016) finding that parents want their children to use technology for educational and vocational advancement in the 21st century, Johnson believed that parents were compelled to allow their children to learn and use technology to compete for jobs in a technologically saturated society. However, also similar to Pereira's (2016) findings, the parents admitted to struggling with setting rules and regulations, as they relate to technology use, because the parents cannot look to their own childhoods as a frame of reference (Johnson, 2014).

Of the studies summarized in this section, most focused on parental attitudes about children's technology use in the early primary years rather than teenagers. Some themes relate to any child, regardless of age. For example, the higher the education and occupation levels of the parents, the greater the importance of the role of electronic media in their children's lives. Moreover, the parents struggle to create balance between technology use with other aspects of their children's lives, and many were concerned that technology could negatively affect the development of their children.

Another theme revealed in the literature is that parents are generally well informed about new technologies and welcome its presence in their household.

According to Vittrup et al. (2016), the parents and children in question were both heavy consumers of media (technology), and the parents believed that technology positively affected their child's academic development. Similarly, Pereira (2016) found that parents also acknowledged the computer as an academic tool with a positive impact on their children's lives. However, despite the perceived positivity of technology, Pereira also found that parents vocalized concerns about security settings and their children's potential access to inappropriate content. These parents also feared that heavy technology use would subtract from their children's time spent exploring other extracurricular activities, like playing outside or reading. Plowman (2016), on the other hand, found that the behaviors of adults and guardians – whether parents, siblings, grandparents or cousins – can directly influence the technological behaviors and consumption of children. A common thread throughout the research cited in this discussion, namely by Johnson (2014) and Plowman (2016), is the admitted uncertainty toward how to properly regulate time and content accessed via the Internet. Because the parents in question did not experience a childhood that was saturated with technologies, they were unable to look to their own childhoods as reference points, and were instead forced to start from scratch with their own children.

Barriers to Using Digital Technologies in Schools

According to Young et al. (2013), the adoption of technology is subject to the attitudes, abilities, and technological capabilities of its users. Though the significance of technology in the classroom has increased – and will continue to do so – successfully infusing technology into the curriculum is both a challenging and complex process. Rosa

(2013) suggests that digital technology inclusion in the field of education is a social right and must become the primary focus of public policies surrounding education. However, several barriers continue to influence the marriage of technology and academics.

These barriers vary greatly and may encompass any influencer, from monetary resources to sociocultural influences, support, infrastructure, and teacher self-efficacy, or a combination of these. Nikolopoulou & Gialamas (2015) noted the major barriers regarding the incorporation of technology in the classroom has been a lack of funding, inadequate professional development and other training opportunities, and lack of administrative and technical support, as well as the teacher's self-efficacy. Reid (2014) distinguished that schools are hesitant to incorporate these new technologies, due to the immense costs and lack of sureness concerning their effectiveness. Reid also cites other barriers to technology assimilation as access to technology, support and professional development, administrative support, and self-efficacy of the teachers . Amaechi (2016) found that teachers have been faced with pressures from administration to regulate technology, as well as pressures from students to encourage – and allow – the frequent use of more technologies. Researchers Nikolopoulou and Gialamas (2016) found barriers toward the use digital technology in schools which include the physical setting of the school, the lack of hardware, the condition of the equipment, the lack of training, the lack of teacher motivation, and the presence of overcrowded classrooms. The following research examines these barriers toward implementing educational technologies in schools nationwide and across the globe.

General barriers. According to Nikolopoulou & Gialamas (2015), there have been an increasing number of studies that document the potential of educational technology to create engaging, motivating, and innovative learning opportunities that can support learning, collaboration, and communication. However, these studies have not indicated the costs merited by the inclusion of technologies in schools (Reid, 2014). According to Reid, when schools decide to incorporate new technologies, they are exhausting a significant percentage of the school's budgets, without the surety of producing results that meet the district's expectations and goals.

Nikolopoulou and Gialamas (2015) studied 134 early childhood teachers in Greece to investigate the teachers' perceptions of barriers to using technology in early childhood education. All the participants, who included females with a wide range of both teaching and technological experience, submitted a questionnaire that consisted of 26 questions that assessed self-efficacy using technology and attitudes about the effective and appropriate use of computers and other educational technologies in the classroom. For example, one of the questions asked was, "Do you believe the computer to be an appropriate tool in supporting and developing children's learning?" Several of the questions related to the barriers of technology use in schools and cited factors, such as access to resources, support, time and self-efficacy. Nikolopoulou and Gialamas analyzed the mean values and standard deviations of the quantitative data to find that the major perceived barriers regarding the use of technology in early childhood classrooms include lack of funding, inadequate professional development and other training opportunities, and lack of administrative and technical support. The researchers also learned that a

teacher's confidence with technology, otherwise recognized as self-efficacy, directly impacted the extent to which technological resources were used in the classroom. The more content the teacher felt toward using technology in the classroom, the more likely the teacher expressed a positive attitude toward using those resources. The implications of this study suggest that teacher training could benefit and support teachers with the use of educational technologies in the classroom.

A study conducted by Amaechi (2016) explored similar barriers, though with the assimilation of mobile smartphones into the classroom setting. According to Amaechi, researchers such as Brown (2014) and Jansen and Phillipson (2015) have noted that integrating mobile technologies into the classroom setting has potential academic benefits. However, because the phenomenon is relatively recent, there is little information about mobile smartphones as they relate to academia (Amaechi, 2016). Instead of perceiving mobile smartphones as a potential tool, some academic stakeholders have seen it a mere distraction. Amaechi conducted a study over two academic years that was aimed at finding the relationship between mobile phone ownership and race. However, the study unveiled information about barriers faced by teachers regarding the use of mobile smartphones in school districts. In this qualitative case study, the researcher conducted interviews of administrators, teachers, and students at a school in Cambridge, Massachusetts, which had 1,800 students, and an alternative school in Somerville, which had 77 students. Although the two schools varied greatly with regard to their mobile phone policies – Cambridge allowed teachers to decide their individual policies, while Somerville mandated a school-wide, zero tolerance policy – teachers from both schools

cited a conflict between meeting the expectations of administration and responding to the behaviors of their students. The administration pressured teachers to regulate the use of mobile smartphones, while students pressured teachers by overlooking the school's policy and using their smartphones, regardless of whether the use was for academic or extracurricular purposes. Due to the expectations from both sides, teachers were not only unable to equally address both subjects, but they were also unable to experiment with creative learning experiences that used the presence of the mobile smartphones. As previously cited throughout this research, because teachers are bound by restrictions enforced by the school district, they must adhere to these regulations, regardless of whether these rules consider the implications of technology use in the classroom setting, whether computer, mobile phone, or other.

The presence of technology in schools is a costly endeavor, with millions spent on instructional technologies each year. However, school administrators often complain that instructors are not adopting these technologies and teachers are unsure about how to effectively engage their students with their use (Hammonds, Matherson, Wilson, & Wright, 2013). In a review of literature concerning the barriers to teacher adoption of educational technology, Reid (2014) found that some issues present more of a challenge than others. For instance, high barriers were associated with a vague definition of successful adoption means and the range of resistance teachers had toward using educational technology in the classroom. This study defined barriers to technology use as: access to technology, support and professional development, administrative support, and self-efficacy of teachers. Reid also found that the educational environment was a

noted barrier, particularly the ability of the organization to react to change, legal and policy issues at play, and tensions found among faculty members and other staff members.

The following portion of the literature review addresses the barriers cited by Nikolopoulou and Gialamas (2016) and Reid (2014). These barriers, as previously stated, include inadequate physical settings, lack of technological resources and funding, inadequate conditions of equipment and maintenance, lack of training and interest, low socio-economic status, and overcrowded classrooms. The following sections include the synthesizing of the three journal articles mentioned above with information pertaining to the barriers of resources, support, infrastructure, socioeconomic and cultural influence, and self-efficacy.

Specific barriers. Arguably, there are innumerable factors that could influence the smooth assimilation of technology into the educational world. However, this study predominately focuses on the major resource and support barriers that contribute to this diffusion. This section describes the resource barriers, namely those of money and resource materials, as well as support barriers, which entail institutional support from the school districts regarding instructional training programs for teachers.

Resource barriers. According to the research, resources are fundamental to instructional and curriculum implementation. Resources, in this context, may be referred to as actual hardware or monetary resources. According to Hofstra, Corten, and Tubergen (2015), and much of the research cited previously, adolescents with access to more technological resources are more likely to use online resources and tools than those with

lesser access. On the other hand, according to Nikolopoulou et al. (2016), one of the first requirements of technological adoption in an educational institution is the adequate availability of the technological materials.

According to Zheng et al. (2016), the dynamic of dispersing individual computers throughout a school but having them unavailable to all students simultaneously had a marginal effect on the students' performance outcomes. Zheng et al. conducted an analysis of 65 journal articles and 31 doctoral dissertations, published between January 2001 and May 2015, to explore how a one-to-one laptop program has impacted the learning process in K-12 schools. This notion suggests that if technology is available to some students, it must be available to all students and should not discriminate due to the financial status of the students' parents or caregivers. Although an administration is not responsible for the technologies afforded to students by their families, they are responsible to whether all students are equally entitled to technologies inside of the classroom setting. This, however, places a heavier burden on the schools to compensate for those families that cannot afford the technology; the funding must come from elsewhere.

According to Reid (2014), obtaining the technology can function as a barrier against the adoption of the technology, due to lack of access, reliability and complexity of the resources available to the teacher to incorporate technology into the classroom. Despite their unique teaching abilities, however, Aubusson et al. (2014) found that teachers were bound by regulations, restrictions, and access to resources that can affect their ability to introduce non-traditional educational hooks, like technology, into the

classroom. Nikolopoulou & Gialamas (2016) found that teachers were less likely to seek out technology as a support for the curriculum if there was insufficient funding for both hardware and software in classrooms. Thus, teachers make do with the resources available to them, rather than seek out alternatives that are unfeasible. Moreover, according to Reid (2014), most faculty members were dissatisfied with investment in technology and the distribution of available resources amongst other departments. These findings suggest that technology is unequally distributed among teachers and classrooms, which may cause some teachers to reserve their own technology in storage rooms, transport the technology, and set up the technology themselves if they so wish to use it. However, it is not the teacher's responsibility to circumvent the lack of resources by purchasing resources on their own. Conversely, according to Wang et al. (2014), although some teachers believed that enough technological resources will yield successful technological integration, even with full access to technology, some classrooms remain unchanged.

The overarching resource that is needed for technological initiatives is funding (Wang et al., 2014). Without critical funding from outside sources, schools are unable to offer the technology to its students. If technology is available, teachers must be instructed on its proper use. Even with these two resources, the technology must be frequently maintained with updated programs and quality function, which also requires funding. Students must also learn how to use these technologies in their educational experience, and grow comfortable with technology in the classroom. Ultimately, the resource itself – the technology – requires the resource of funding to within a school district, and once the

technology is acquired, its maintenance requires more monetary resources. Therefore, technology in the classroom is entirely unfeasible without the present of proper resources, namely funding.

Support barriers. In a meta-analysis of research on technology adoption, Reid (2014) found a common complaint from faculty was the lack of institutional support for the use of instructional technology for teachers. This instructional material was initially needed for teachers to become more familiar with the technology. If teachers are primarily expected to use these technologies, they must be aware of how to properly engage with the technologies to provide a valuable learning experience for students. If teachers are experiencing confusion, students may also be confused. Thus, teacher supports and services are critical, such as professional development seminars, mentoring, and/or observations, because these programs can help their confidence levels improve. These supports can also help the teachers progress from that of non-adopters of educational technology – people who are unaccustomed to the new technology – to effectively using technology in the classroom (Nikolopoulou & Gialamas, 2016).

Students may also encounter barriers to technology use in the classroom, which can pose additional problems for teachers (Reid, 2014). Reid examined scholarship concerning the barriers to teachers' adoption of technology. One finding indicated that students may be unaware of how to learn when faced with new approaches to teaching. To best assist these students with the learning process, professional development should be supplied for the teachers, to prepare them for this challenge. In this instance, the formal training for teachers would be imperative to the students' experience.

Without funding, Reid noted (2014), there is little availability for schools to purchase technologies. However, a lack of support on behalf of schools is considered a significant barrier. According to the research, even if technologies are financially feasible for certain schools, these schools will not provide students with positive educational experiences if the instructors are unaware of how to use the technologies. If young students are being taught how to use the Internet for research purposes, for instance, and the teacher is also somewhat unaware, then it is unlikely for the lesson to be particularly successful. This notion is equivalent to having an individual purchasing a new product, like a desk, and expected to put together the desk without the instructions. In this scenario, it is likely that the customer will eventually learn how to properly put together the desk, but it will surely take longer than if the instructions were initially provided. For the teacher to provide a valuable experience – and to use the technologies appropriately – the teacher must undergo formal training that demonstrates the tools' proper use When taking into consideration the great deal of money and planning that is designated for educational technology, it appears insensible for school districts to simply assume that teachers will understand how to use the technologies appropriately.

Infrastructure barriers. Infrastructure as it pertains to the ability of schools to house technology has received little attention in research (Ishaikhi, 2015; Reid, 2014). However, when schools adopt new technologies, it is known that the school's infrastructure is required to support said technology. The infrastructure, in this context, refers to the physical design of the school and/or the technical backend of the school,

such as the speed of Internet connections. The following section describes the role of infrastructure as a barrier to the implementation of technology in schools.

If a school can house a computer lab, the school's infrastructure must be able to physically – and legally – accommodate the space (Ishaikhi, 2015). Ishaikhi contended that the computer lab must abide by state safety regulations while offering enough computer stations to accommodate the number of students, whether that be the number of students in a class, in the school, et cetera. The computer lab must be connected to reliable source of power and consistent Internet speed. Other barriers include designated rooms may be too small to house a computer lab, some may require the installation of wired or wireless Internet connection, other rooms may require the installation of additional outlets for computers and schools may require the creation of a network system to link all the computers throughout the building. Within the component of infrastructure, the space required by the hardware may be problematic. The designated computer lab space must be able to house the technologies, including laptops and desktop computers, and perhaps printers and any other associated technologies. Thus, infrastructure can be a barrier to adoption.

According to a phenomenological study of 13 grades four through eights teachers, teachers reported that infrastructure problems in their schools, of which included concerns about the Internet speeds being too small or invariable (Bartolo, 2017). Although this is not a concern in terms of physical design, the Internet speed – which is certainly a matter of infrastructure – can significantly impact the quality of learning and the students' access to needed materials. If students are learning a new lesson, for

example, and suddenly the Internet speed dramatically slows down or connection ceases entirely, even just temporarily, these interruptions to the learning process cause distraction.

Ishaikhi (2015) conducted a study of scholarship, like the present study, concerning the barriers to integrating technology in higher education schools in the South African country of Libya. Using Rogers's (2003) diffusions of innovations theory to frame the study, the researcher analyzed the physical and mental barriers that challenged the smooth integration of technology in the higher education setting. With regard to infrastructure, Ishaikhi found that time is a component of the infrastructure problem. Although a computer lab may be physically present in a school, the teachers and students alike must circumvent time barriers, which may include other students, classrooms, and teachers use of the computer lab. Despite the physical presence, the computer lab itself may remain physically unavailable at certain times of the school day.

The most outstanding infrastructure problem is the availability of the school to physically house technology (Ishaikhi, 2015). Schools with outdated infrastructure or a lack of reliable power and Internet source, for example, may be unable to properly accommodate for a computer lab. However, in addition to the physical infrastructure, this section also involves the matter of time. Despite the physical presence of technology, the students and faculty alike must circumvent the usage of their peers to use the technology. This matter may become even more present when there are few technologies available to accommodate a large student body.

Teacher self-efficacy. Self-efficacy, which can be a barrier, entails the teachers' competency to use the technologies, but, more importantly, how confident the teacher is with using technologies. If a teacher is comfortable with the technology and teaching the topic using these technologies, he or she directly impacts the learning experiences of the students.

According to Reid (2014), who studied the barriers to teachers' use of technology in K-12 education, teachers who do not know how to use a computer usually do not want one in their classroom. This notion goes hand in hand with the information provided about the previous discussion of teacher support. Nikolopoulou and Gialamas (2015) examined barriers to the integration of computers in early childhood educational settings and found the greater the teacher's confidence with technology, the more likely it is for the teacher to effectively use technology in the classroom. Inversely, if a teacher is not well informed as to the current technologies, the teacher is less likely to effectively use the technology to provide a valuable learning experience for students. In the dynamic of introducing new technologies into a classroom, a teacher's competency regarding the ability to teach a course may be compromised. For example, a teacher may be highly competent in teaching the subject of English in a traditional manner, but if a teacher that is unfamiliar with new technologies is instructed to teach English with the assistance of computer-generated programs, their ability to teach the course may be compromised unless support is then provided by administration. Tenured and seasoned teachers who demonstrate a lack of desire toward incorporating technology into the classroom may believe that they do not need additional training because they are successful in teaching

using traditional teaching methods (Nikolopoulou & Gialamas, 2015). These teachers, therefore, do not display the motivation to introduce technology into the classrooms and therefore reject its inclusion into the classroom completely. Self-efficacy is a barrier to adopting educational technologies, because those who do not perceive a need for its use and/or do not value its contributions to improving student learning therefore reject the notion that support is needed to move toward a pedagogy that includes instructional technology. This dynamic demonstrates the laggard group that is evidenced Rogers's (2003) diffusions of innovations theory. As stated previously in this review, the laggard group is typically resistant to the innovation and is the last group to adopt a new innovation, which is due, in part, to the inability to see its value (Reid, 2014).

The influence of socioeconomic and culture toward implementation. In addition to the resource, support, and infrastructure barriers, socioeconomic and cultural barriers also impact the integration of technology (Dutton & Blank, 2013). Schools can control the availability of technology within its walls, but they are unable to control whether or not students have access to technology at home. Students from lower socioeconomic demographics may be unable to obtain technologies outside of school, while students from higher socioeconomic demographics can.

The socioeconomic status of the neighborhood in which a school is located, as well as its surrounding neighborhoods, in addition to the cultural influences of the students, may pose as barriers to the experience of technology in the classroom. There has existed a divide in access to broadband Internet connections that was created by socioeconomic status and location (Hill, Troshani, & Burgan, 2014). According to Hill et

al. , people who live in more urban areas with higher incomes have been more likely to have access to quality broadband Internet connections that offer a key advantage to economic growth, social wellbeing, and access to resources. In a longitudinal study that used survey data collected from 2,057 participants, Dutton and Blank (2013) found new patterns of accessing the Internet explaining that there was an emergence of Internet user who had technology access on multiple devices in everyday life for both work and pleasure purposes. This type of user may have a personal computer at home, a tablet computer for mobile use, and a smart phone, with the possibility of other devices in possession as well. First-generation Internet users have been typically from lower socioeconomic demographics and, as a result, were anchored to one personal computer at home and possibly one at work, limiting the scope of access on behalf of these users. Dutton and Blank showed that there is a socioeconomic inequality that creates a digital divide in the use of the Internet, whether for vocational, educational, or personal reasons. This notion suggests that those attending schools located in more privileged areas will have access to more avenues of technology access than those attending schools in lesser privileged areas.

Students can improve their technology skills through frequent use in school (Barrett, Moore, & Slate, 2014), however, there has been a knowledge gap between students with and without access to technology at home. Lack of access to digital tools and resources at home has proven to hinder the prospects for students, whereas early exposure in school can reduce the gap in children's computer skills at an early age. Barrett et al. (2014) analyzed the ratio of computers to students at 2,716 elementary

schools for the 2009 to 2010 academic year and 2,525 elementary schools for the 2010 to 2011 academic year. Data for this study was provided by the Texas Education Agency and was submitted by the principals of the individual schools. From this study, Barrett et al. concluded through a quantitative statistical analysis of data that computer access was less common at high poverty schools, and students attending both Hispanic-majority and black-majority schools had less access to digital technology than at white-majority schools. This study suggests that helping students from high-poverty, high-minority elementary schools by providing access to digital technology is critical to closing the digital divide.

By providing students with technology access in schools, these schools are helping students familiarize themselves with its use, regardless of their socioeconomic demographic (Barrett et al., 2014). However, as previously stated, the schools are not responsible for the availability of technology to students outside of its walls. The ability of students to have access to technology outside of school can improve their familiarity and skill set, setting them at an advantage over those who do not have access to these technologies. Schools are striving to close this gap by providing technology to all students, regardless of their background.

Summary

The research presented in this chapter provides insight as to the implementation of technology in school settings. Several themes emerged. Scholarship shows that placing a digital device into the hands of every student in a single school has been found to yield positive results, which includes improved educational outcomes and increased motivation

toward learning (Harper & Milman, 2016; Zheng et al., 2016). Research shows that there are many issues associated with implementing one-to-one laptop programs, including access to resources, support, infrastructure, socioeconomic and cultural influence, self-efficacy, and student, teacher, and other-stakeholder buy-in. There have been many studies conducted exploring the benefits of technology use on students' motivation, attitudes, and learning outcomes, but no research has specifically explored how the parents of high school students feel about such technology use in an educational program, particularly a one-to-one laptop program (Léger & Freiman, 2016). Because parents are integral members of an education system and its decision-making processes, it would be beneficial to explore how this group of stakeholders perceives the benefits of implementing educational technology for increased learning. This current study aims to provide an exploration of this gap.

The following chapter, the research method, provides a discussion about the following: research design and rationale; the central concept; the research tradition and rationale; the research approach; the role of the researcher; the methodology; the participant selection logic; the data collection tools; the procedures for recruitment participation and data collection; the data analysis plan; issues of trustworthiness; transferability; and confirmability and ethical procedures.

Chapter 3: Research Method

Introduction

My purpose in this case study was to examine the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program at two large, urban secondary schools in the southwest United States. The perceptions of these parents were generally defined as their opinions, beliefs, and attitudes toward take-home laptops being given to their children. A substantial body of research has surrounded the attitudes of teachers and students toward the use of technology in education, but there have been few studies that examine the parent stakeholder group (Blackwell et al., 2013; Nikken & de Haan, 2015). The research community surrounding the field of education does not currently know much about parents' attitudes regarding their children's use of technology both inside and outside of school and whether their children require information sources and training (Nikken & de Haan, 2015).

This chapter is organized into five sections to describe the methodology used in this study. The first section, research design and rationale, reinstates the research question, defines the central concepts, identifies the research tradition, and explains the research approach. The following section, role of the researcher, explains the researcher's role, reveals any biases that the researcher may have had and describes other ethical issues related to this study. To provide transparency and reproducibility, the methodology section identifies the population selection logic, provides support for the researcher-developed instrumentation, and describes the data analysis plan. Next, the section about

trustworthiness discusses issues of credibility, transferability, dependability, confirmability, reliability, and ethical procedures. The chapter concludes with a summary that reviews the main points of the chapter.

Research Design and Rationale

Research Question

The qualitative research question guiding this study was: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school? This question was developed based on my observations as a STEM teacher and technology coordinator at a large, urban high school in the southwest United States that is currently in its third year of a one-to-one take-home laptop program. This question was also developed based on the available literature regarding people's attitudes toward using technology (Devlin & McKay, 2016; Eng, 2013; Gupta, 2015; Kubiatko, 2013; Luijkx, Peek, & Wouters, 2015; Vittrup, Snider, Rose, & Rippy, 2016; Westerman, Daniel, & Bowman, 2016), the use one-to-one laptop programs in education (Crook, Sharma, & Wilson, 2015; Islam & Andersson, 2015; Pereira, 2016; Tallvid et al., 2015) and how technology impacts education (Robinson, 2016; Vaughan, 2014). The research for this study was based on a gap uncovered in the literature regarding the other stakeholder groups surrounding educational technology matters, such as students' parents (Bate, MacNish, & Males, 2013; Nelson, Fien, Doabler, & Clarke, 2016). The research question was used throughout the study as a guide and point of focus to understand and explore the attitudes that parents have on their children participating in a one-to-one laptop program.

Central Concept

The use of technology has permeated all facets of modern-day society including education (Brown & Green, 2017). In this study, I aimed to generate a deeper understanding of the attitudes that parents have toward their high school-aged children using one-to-one laptops as an integral part of their educational program. According to prior research, the perceptions of parents regarding technology in the classroom are largely unclear (Bate, MacNish, & Males, 2013; Nelson, Fien, Doabler, & Clarke, 2016). Blackwell et al. (2013) found that parents are integral members of a school's community and their opinions and attitudes are important factors in decision-making matters. I chose the parent group as a center of focus in the school community because a gap was found in the research that indicates that the perceptions of parents toward one-to-one laptop programs are virtually unknown. Understanding how other demographic groups in the school community perceive the use of technology in an educational setting is important, though this area has been saturated with research studies and serves as the basis for this research study (Ardies, De Maeyer, Gijbels, & Keulen, 2015; Campbell, Coster, & Longhurst, 2014; Devlin & McKay, 2016; Fabian, Topping, & Barron, 2016; Mouri & Arshad, 2016; Nair & Bind, 2016; Nikolopoulou & Gialamas, 2015; Pereira, 2016; Robinson, 2016; Tallvid et al., 2015; Thys, Verschaffel, Van Dooren, & Laevers, 2016; Torres-Diaz et al., 2016; Vaughan, 2014; Wang, Hsu, Westerman, Daniel, & Bowman, 2016). This research study explored the perceptions of parents toward their children using these one-to-one laptops, not only inside the classroom, but outside as well. This research study was designed to allow me to explore and understand the opinions, beliefs, and

attitudes that parents have regarding the school community, their children participating in a one-to-one program, and the one-to-one program itself.

Research Tradition and Rationale

A qualitative research tradition was used for this research study because I wanted to form a holistic and coherent understanding of parents' perceptions toward the use of a one-to-one laptop program (Padgett, 2016). Qualitative research provides rich data from such sources as interview transcripts, observation notes, and analysis of documents that can help the researcher explore a central concept through discovery and exploration to provide profound and provocative insights to explain and provide understanding of a phenomenon (Mathison, 2005). Qualitative researchers use this kind of data to answer many of the *why* questions that they develop in their quest to explore the human elements of a given topic that are expressed in the words and thoughts of the participants (Given, 2008).

Qualitative methods allow the researcher to study an issue in depth with a great amount of detail directly from the participants without being bounded by the standardized measures and predefined categories of quantitative methods (Patton, 2015). In quantitative methods, numbers are assigned to a restricted number of response categories that are predetermined and standardized and implemented to large populations (Given, 2008; Lavrakas, 2008). This allowed me to collect the responses from a limited set of questions and measure their reactions to pre-defined presets. While collecting data from large numbers of people provides a great amount of broad generalizability, it cannot provide the detailed, in-depth and unique information that qualitative research can

provide with a focus on a smaller population. In this study, I did not need to measure the reactions of a larger number of people to provide generalizability to other populations. This qualitative study focused on a relatively small group of people and their varied and deep experiences and perceptions to answer the research question regarding parents' perceptions on a one-to-one laptop program (Yin, 2014). The research question demanded open-ended, descriptive data because little is known about parent perceptions of laptop programs and the in-depth data can provide understanding which quantitative methods would not provide. A qualitative tradition helped me understand how and why parents feel the way that they do and how these attitudes were created through social processes (Rosaline, 2008).

Research Design and Rationale

This study used a qualitative approach, specifically an exploratory case study methodology. This section provides a rationale for a qualitative exploratory case study, and an explanation of why quantitative or other qualitative approaches are not suitable.

Exploratory Qualitative Case Study Design

Qualitative research can be characterized as an exploration of a social or educational issue from the viewpoint or perspective of participants (Patton, 2015). Using this definition, a qualitative research design was the best choice to investigate the research question because the focus was on the experiences, attitudes, and beliefs of *parents* toward a one-to-one laptop.

Exploratory research is a methodological approach primarily concerned with discovery and exploration with the researcher being the explorer (Jupp, 2006). This form

of research explores phenomena characterized by a lack of detailed preliminary research, but it can offer significant clues about a given situation (Mills, Durepos, & Wiebe, 2010). It is limited to the explored subject populations and subject to the judgements and interpretations of the researcher. In this exploratory case study research, the focus was on the in-depth stories of a small number of participants. Concentrating on one person, group, program, organization, or issue, this design was used to gather data from multiple sources including documents, interviews, and observations (Marshall & Rossman, 2006). This study increases the confidence of analytic conclusions drawn from the results because parents from two different schools implementing a one-to-one laptop program provided a basis of contrast.

The review of literature in Chapter 2 indicates support for the case study approach for the examination of specific people and types of technology in school settings. Research focusing on demographic populations heavily relied on survey research methods to understand the attitudes toward technology, including older adults (Damadoran, Olphert, & Sandu, 2014), younger adults (Abedalziz et al., 2013), males and females (Aubusson et al., 2014; Jaradat & Faquih, 2014), educators (Buchanan et al., 2013; Carver, 2016; & Hsu, 2016), students (Ardies, De Maeyer, Gijbels, & Keulen, 2014), and parents (Vittrup et al., 2016). However, case study strategies were used to examine less understood and more specific aspects of school-based use of technology such as one-to-one digital device programs (Dobuzinskis, 2013), teachers' attitudes (McKnight et al., 2016), students' attitudes (Gustad, 2014), parents' attitudes (Johnson, 2014), and barriers faced by teachers while using technology in the classroom (Amaechi,

2016). It is evident throughout the literature review that both survey research and case study were both appropriate and useful for the study of people's attitudes toward using technology. However, this study used an exploratory case study method instead of the survey approach because I needed to ask how and why questions, key inquiries characteristic of case studies (Yin, 2014), to explore the central phenomenon of parents' attitudes toward the use of a one-to-one laptop programs at the secondary school level. Case studies can be much deeper in scope but more focused in participation. In the case study approach, interviews and focus groups allowed the me to ask open-ended questions and to craft follow-up questions depending on responses. The interview questions developed served as a guide that could be manipulated and changed allowing me to dig deeper and redirect conversations.

Yin (2014) states that the "distinctive need for case study research derives from the desire to understand complex social phenomena" (p. 4). Parents' perceptions of a one-to-one laptop program can be considered a complex phenomenon because parents have different kinds of attitudes towards their children, education, and the use of technology in their own lives and in the lives of their children. Some parents may be comfortable using technology and allow it to permeate throughout their children's' lives, while others may be considered technophobes and fear that it may negatively affect their children's life. The home and family life of students might be quite varied, with varying levels of time spent together and forms of discipline. A laptop program that occurs only in the classroom can have relatively consistent guidelines, monitoring, and uses among all the students. A teacher who uses a classroom set of laptops to teach a lesson on space

exploration will have the ability to monitor each student and make sure that each one stays on task and uses the technology for its intended purpose for the duration of the lesson.

The nature of a take-home one-to-one laptop program is even more complex because there is much less control when technology is taken out of the classroom and sent home. Its proper usage and guidance rely on factors that are completely outside the control of the teacher or the school. Some parents might pay close attention to what their children are doing on the laptop while implementing a strict set of rules and guidelines, while others may not regulate or monitor the laptop usage at all. There are many different reasons this may occur such as parents working nights or long hours, being involved with their other children, or not having the knowledge or skills to do so. Thus, perceptions of parents are most likely to be diverse and varied hence the need for deep exploration given that the context and implementation as well as parental beliefs result in complex phenomenon. This exploratory qualitative case study allowed me to dig deep into a wide range of perspectives and to understand the context in a unique way that quantitative methods would not permit.

In this exploratory case study, multiple cases were used to examine the attitudes of parents toward a one-to-one laptop program implemented at two high schools in the same large urban school district in the southwestern United States. Multiple case study includes two or more observations of the same phenomenon (Yin, 2014). Using more than one case enables replication and confirms emerging constructs and propositions by being able to compare and find patterns (Lewis-Beck, Bryman, & Liao, 2004). It also

enables "the cases to reveal complementary aspects of the phenomenon and the result is more robust and generalizable" (p. 684). I chose a multiple-case design because it can provide evidence that is more compelling and robust than evidence from a design that only uses one case (Yin, 2014). Also, single-case designs are intended for cases that are unusual or extreme and this research seeks to explore cases that involve an educational innovation that, according to Yin, is better suited for multiple case designs.

Exploratory Case Study Versus Other Qualitative Designs

Other qualitative research traditions such as phenomenology, ethnography, and grounded theory were used throughout much of the literature in Chapter 2 in which people's experiences with and attitudes toward technology both inside and outside the educational environment were studied (Abedalaziz et al., 2013; Ardies, De Maeyer, Gijbels, & Keulen, 2014; Luijkx, Peek, & Wouters, 2015, Nikolopoulou & Gialamas, 2015). These methods were rejected because they cannot adequately allow the research question to be answered. For example, grounded theory design is used to create a theory grounded in interview data from which the research identifies patterns in the data to formulate a theory. The goal of this study was not to form a theory thus this method was not appropriate.

Phenomenology was another possible design for the study. One of the main characterizations of the phenomenological tradition is the focus on participants' experience of the world around rather than how they reflect upon it (Given, 2008). Phenomenology describes how humans experience phenomenon, such as having a life-threatening disease, or living through the Great Depression. Phenomenology certainly

could have been used for this study, but the holistic nature of case study allowed me to answer the research question by integrating points gained from multiple sources of data and analyzing their interconnectedness.

Ethnography includes multiple data sources which are melded together to form a picture of cultural experiences, behaviors, and beliefs. The ethnographer is both a scientist and storyteller, researching social and cultural influences from the insider's perspective (Given, 2008). Data sources can include artifacts, interviews, and observations. This method was not used as a method in this study because it was not appropriate to answer the research question which focuses on parent perceptions and attitudes and not on cultural influences.

Exploratory Case Study Versus Quantitative Design

A qualitative exploratory case study approach allowed me to gain a holistic and real-world perspective that can be exploratory, descriptive, and/or explanatory (Yin, 2014) in a way that is not possible with quantitative approaches. The case study helped to answer the research question about parents' perceptions about their children being a part of a one-to-one laptop program and why they felt that way without limiting data to pre-determined presets, such as in a survey (a common method as indicated from Chapter 2) or archival analysis study. The survey approach would have allowed me to ask the same predefined set of questions to a large group of people with a limited scope but with much greater participation (Lavrakas, 2008). However, questions in the survey approach are not changeable and cannot be manipulated to allow for exploration or further clarity which is

necessary when examining parental perceptions because little is understood upon which to base a survey.

Other quantitative approaches are equally lacking. A case study does not require control of behavior events, as required of an experimental study or a historical study that focuses on non-contemporary events. While a quantitative study could examine many different variations of laptop programs across larger populations and produce more generalized results (Ryan & Cousins, 2009) it could not provide rich data from smaller groups of participants who can elaborate on their thoughts as can a case study approach.

Role of the Researcher

My role as the researcher in this study was that of an information gatherer and facilitator. Merriam and Tisdell (2015) state that a researcher who is connected through work or a social situation to what is being studied must strive to be sufficiently detached to observe and analyze subjectively. Even though I have been both a teacher and coordinator at a high school in the same school district as the two cases in this study, I have not been a teacher at one of the participating high schools. I have also not been a parent of a child in a one-to-one laptop program and not had the experience or qualifications that this study requires in order to participate.

My role as a researcher was to systematically and carefully explore the case to reveal issues and perceptions among the parents. Because I have not been a parent, my exploration stemmed from an emic perspective rather than from one that is etic, from my own perspective (Stake, 2010). I wanted to approach this study with an open mind that

was not restricted by my own preconceptions or biases nor limited by my own knowledge.

The information that I could positively contribute to this study was that of my own experiences that have served as some of the motivations for conducting this research. These experiences included working with students in a classroom using one-to-one laptops, observing students using their laptops both inside and outside of classrooms for both educational and personal purposes, and interacting with parents and helping them have conversations with their children regarding the appropriate use of technology. These experiences caused me to be an insider-researcher who has both insider knowledge and experiences in the situation and context of the study (Costley, Elliott, & Gibbs, 2010). I have experienced the benefits that educational technology can provide, though I also understand the harms that it could produce. I believe that my experiences with students, teachers, parents, and others in education have provided me a rich and broad fundamental understanding of people's attitudes toward technology that have helped me form connections and deeper meanings in order to answer my research question.

I strived for the highest ethical standards while conducting this research and continually had a responsibility to scholarship, maintained a strong professional competence, and divulged identified limitations (Yin, 2014). To minimize any potential biases, I identified any preconceived notions and ensured that they did not affect the outcomes of this study (Yin, 2014). I recognized any preconceived notions or beliefs that I had through note-taking and reflection to reduce bias. I reflected on my own or with professional colleagues to maintain subjectivity and fidelity. Even though the parents

selected to be participants for this study were associated with the same school district that I have worked in, I ensured that I did not have any established rapport or relationship with any of them prior to making first contact with them for the purposes of this research. I had no supervisory or instructional roles over the parent participants or anyone else including teachers and other staff members in the participating schools. These participants may have been familiar with my status in the school district due to the jobs that I performed at my own high school, but I made every effort to reduce any bias by ensuring the condition of minimal unfamiliarity was met. This understanding helped me to remain impartial and not allow any preconceived notions to affect my ability to collect and analyze the data.

Some potential conflicts that I might have encountered included personal knowledge of or experiences with the parent participants' children and others, such as teachers and administrators, which may have occurred during the interviewing process. I reduced this possible conflict as best as possible by not selecting the school that I have worked at as one of the cases, even though it had implemented a one-to-one laptop program like the ones involved with the cases in this study. I ensured that I reflected on any of these biases and tried to avoid conflicts by taking notes of any conflicts that may have hindered my ability to provide unbiased data. To further reduce bias, I used precoding in the analysis phase of this research study, but I created new codes that I did not anticipate and made as many connections to new ideas as possible.

Methodology

This section begins with a description of the study population and the participant selection logic that was used for this study. Following this, the instrumentation to collect data is detailed and the procedures for recruitment, participation, and data collection is discussed. Finally, the data analysis plan describes the connection of data to the research question, type and procedure for coding, and software used for analysis.

Participant Selection Logic

For this study, the case population consisted of selected groups of parents who had children using one-to-one laptops at two urban secondary schools in the southwestern United States with similar demographics. A multiple case study design enabled me to explore each case, and compare participant characteristics across cases, including the influence of various school locations and the variation of associated attributes of program implementation. Because the demographics of parents at each of the participating high schools were similar but not identical, a within and cross case exploration was based on the gender, age, and racial backgrounds of the parents.

At the time of this study, there were 27 high schools within this same school district that implemented a laptop programs that could have been chosen as cases for this research study, but there was a focus on only two because allowed me to collect rich data across a wide range of dimensions while being able to go into considerable depth (Gomm, Hammersley, & Foster, 2009). The two schools were chosen for this case study using a comparable case selection strategy in which sites and groups were selected based on similar relevant characteristics such as demographics and numbers of students (Miles,

Huberman, & Saldaña, 2014). The collection of data from a diverse group of parents who shared their stories, opinions, and experiences allowed me to explore and find common themes, verify shared attitudes, and further examine perceptions and data that could not be corroborated with others. Each case represented the parents of children across all secondary grade levels that have been a part of the one-to-one laptop program at each school for at least six months.

The selection of individual participants followed Yin's (2014) precept that in qualitative research a purposive sampling method helps to illuminate the propositions of the study. Purposive sampling in qualitative inquiry is the deliberative selection of participants with characteristics that I found to be most desirable to gain rich data that can answer the research question (Lewis-Beck, Bryman, & Liao, 2004). A stakeholder sampling strategy is a type of purposive sampling strategy that was used to help identify the major parent stakeholders who were most involved in and affected by the one-to-one laptop program (Given, 2008). The goal was to identify parents at the two schools who represented the diversity of this stakeholder group including those who had interesting experiences and might have represented diverse perspectives. This allowed comparisons to explain differences between settings and individuals and to select participants who can best answer the research question. For this study, all potential participants met the following inclusion criteria: (a) parent of at least one student who had been participating in the one-to-one laptop program (b) for at least six months, (b) using the laptop both within and outside of school for educational purposes, and (c) having had a grade point average of at least a 2.0. A caregiver was also accepted as a participant given this person

identified as having a parental role and assumed the responsibility of a parent. Excluded in this study were parents (or caregivers) whose children had been a part of the one-to-one laptop program for less than six months, those whom I had known more than as an acquaintance, and those whom would have posed any other inherent biases not noted here.

Each case in this study included a sample of six to eight parents. This was a manageable number of participants that I used to organize into focus groups (Liamputtong, 2011) with six to eight parents in each of the two school focus groups. I identified the various demographics of the parents in total and then made sure that I had a sample that achieved representation of the diversity found at the school. I wanted to ensure that the sample size was not too small and prevented my ability to capture the depth and breadth of information needed to answer my research question. Liamputtong (2011) stated that focus groups of six to eight participants for each case is sufficient to achieve a manageable amount of information that can be rich and meaningful.

Liamputtong (2011) described the point of saturation occurs when additional information does not create new understanding. I wanted to ensure that the sample size was not too small so that it would not prevent my ability to capture the depth and breadth of information needed to answer my research question, but not too large in which the information provided exceeded the point of saturation. This strategy helped me to establish the final group of participants in the case that that would have been more potential participants than needed. The sample was not large enough to be able to generalized among the parent populations at the two schools, but it was able to provide a

wide range of perceptions that represented a holistic view of the parent group (Yin, 2014). The sample size was large enough to have a diverse group of parents to constitute a holistic representation of the total parent population. The identities of the final six to eight participants who were chosen to be a part of the case for each school was kept confidential, securely locked in a file cabinet, and not shared with the administration of the participating high schools or anyone else.

Instrumentation

This study used two types of data. The first was first person perceptions of parents of laptop programs collected through focus groups and follow up interviews. The second included any documents and archival records that detailed information and communications to parents regarding laptop programs and was collected through school personnel. These two types of data provided unique information that gave a rich and varied picture of parent's views about their child's laptop program as befits an exploratory case study (Yin, 2014).

Because this was a case study where I wanted to gain a rich and deep understanding of parents' attitudes, the actual stream of questions in interviews was fluid rather than rigid, typically referred to as an unstructured focus group (Gubrium & Holstein, 2001). Gubrium and Holstein (2001) state that unstructured focus groups allow for the moderator to be flexible with the time and guide the conversation more as a facilitator rather than being ties to the specific questions and structure. In this type of focus group, the participants can have a conversation and talk to each other with facilitator moderation. The questions tend to be more general and serve to guide the

conversation. I chose to first use a focus group strategy because I was not seeking consensus on any issue, but rather I wanted to gather responses from a diverse group of parents that could give me a deeper understanding of their attitudes, opinions, and perceptions (Liamputtong, 2011). The use of one-to-one follow-up interviews allowed me to dig deeper with selected participants so that I could understand why they felt a certain way or had an opinion or attitude (Yin, 2014). Using different types of interviewing strategies enabled me to explore how and why questions and achieve the purpose of the study (Liamputtong, 2011; Yin, 2015).

The focus group sessions took approximately one hour to perform and included questions and prompts intended to gain a deeper understanding of how parents felt about their children being given a one-to-one laptop to use both inside and outside of school (Appendix D). In the development of my interview questions, I strived to use creativity and insight to prompt the participants to share their personal experiences in a comfortable and non-restricted environment (Maxwell, 2013). The questions were developed using a review of literature, theoretical concepts from Roger's (2003) *diffusions of innovations* theory*,* and the type of perception the question would garner (see Table 1).

Table 1

Research Question, Focus Group Guiding Questions, Connections to the Diffusions of Innovations Theory, and Initial Precodes

Research question: Qualitative: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school?				
Focus group guiding questions	Further guiding questions (if needed)	Connections to the diffusions of innovations theory	Perception (attitude, belief, opinion)	Initial precodes
How do you think your child uses his or her laptop at school?	What are some software programs and Internet sites you think your child uses on the laptop at school? What are some non-school related ways your child uses the laptop at school?	Knowledge Relative advantage	Belief	Educational uses of laptop Noneducational uses of laptop
What have you seen your child doing on the laptop at home?	What are some ways your child uses the laptop at home that are related to school? What are some ways your child uses the laptop at home that are not related to school?	Knowledge Relative advantage	Belief	Educational uses of laptop Noneducational uses of laptop
What do you think about your child being given a laptop by the school to use both at school and at home?	What are some of the benefits of the laptop program and why do you think they are benefits? What are some of the harms of the laptop program and why do you think they are harms?	Relative advantage	Opinion attitude	Benefits harms

(table continues)

Focus group guiding questions	Further guiding questions (if needed)	Connections to the diffusions of innovations theory	Perception (Attitude, belief, opinion)	Initial precodes
Where do you go for help if you have any questions or need assistance regarding this issue?	How did you know to go to this person or resource for help? What did you learn from this person or other resource? How did this person or resource affect your attitude toward your child being given a laptop? Where can you go to find out more information? Where are some additional places that you know of that can help you learn more? What additional resources do you need?	Social system Communication channels Social system Persuasion Knowledge Champions	Attitude Belief	Communication channels (family, friends, school, community, church) Training needs Source of training Information being given to parents
How has your opinion of the laptop program changed over time?	What has caused your opinion to change? Why did your opinion change? If someone from another school asked for your opinion about starting a one-to-one laptop program, what would you recommend and why?	Relative advantage Decision Implementation Confirmation	Opinion Belief Attitude	Benefits Harms Training needs Causes of positive opinion change Causes of negative opinion change Neutral Opinions
Do you have anything else that you would like to add to this conversation before we conclude with the discussion?	Would anyone else like to add something?			

Each focus group question that I created was connected to Rogers's (2003) diffusions of innovations theory and intended to garner data that would help me explore aspects of parents' perceptions toward the use of a one-to-one laptop program (see Table 1). Content validity was ensured by making the questions clear, easy to understand, and not too complicated. I was open to explain questions to the participants if they did not understand the language or terminology used, and I restated questions in multiple ways to ensure the questions would be completely understood, if needed. I paid attention to body language and vocal cues to provide me with clues that each participant understood the questions being asked to further ensure content validity. The first question that I asked the focus group participants was, "How do you think your child uses his or her laptop at school?" This question helped set up the relative advantage of how technology interacts with the participants' children's personal lives. This information also allowed me to understand the parents' initial perception toward technology use and how they used it to benefit their own lives.

The next set of questions included prompts such as: "What do you think about your child being given a laptop by the school to use both at school and at home?" and "How has your opinion of the laptop program changed over time?" These questions were intended to allow the parents to honestly share their attitudes and initiate further conversations that would provide data that is both deep and rich. Also, included in the set of interview questions was an open-ended question at the end to allow the participants to add information and thoughts that were not shared earlier in the interview.

In the weeks following the focus group session, I selected a few participants whom I desired to learn more about with regard to their perceptions and feelings. These one-to-one follow-up interviews allowed me to collect additional data from multiple sources so that converging lines of inquiry could be established to allow for triangulation (Yin, 2014). I identified the follow-up interviewees after the focus group sessions and selected them based on several factors. These factors included: (a) participants who I believed had more to say, (b) participants who gave responses that I had questions about and (c) participants that I felt I would be able to dig deeper with to help me make connections, find patterns, and develop triangulation. These individual follow-up one-to-one interviews lasted approximately 30 to 45 minutes and contained questions designed to elucidate further information based on interesting and revealing data that was provided during the focus group session. The questions were developed based on connections to Rogers's (2003) diffusions of innovations theory and their ability to help me garner responses related to parental perceptions (Table 2).

One question that asked the focus group participants was, "What are some inappropriate ways you have seen your child using the laptop?" This question helped set up the relative advantage of how technology interacted with the participants' children's personal lives. This information allowed me to understand the parents' initial perception toward technology use and how they used it to benefit their own lives. In my quest to collect deep and rich data to answer my research question, I sought out additional follow-up interview participants and was open to requesting and scheduling follow-up interviews to the follow-up interviews.

Table 2

Research Question, Follow-Up Interview Guiding Questions, Connections to the Diffusions of Innovations Theory, and Initial Precodes

Research question: Qualitative: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school?				
Follow-up interview guiding questions	Further guiding questions (if needed)	Connections to the diffusions of innovations theory	Perception (attitude, belief, opinion)	Initial precodes
Do you think it is important that your child develop technology knowledge and skills? Why or why not?	How will the world your children will live and work in be different from yours, with regard to the use of technology?	Relative advantage Knowledge Persuasion Social system	Belief Opinion Attitude	Benefits Harms
What do you do together on the computer at home with your child?	What would you like to do with your child on the computer? Please explain what it is like working with your child on the computer.	Relative Advantage Knowledge	Attitude Belief	Parent/child technology interactions Educational used of laptop Noneducational used of laptop Benefits Harms

(table continues)

Follow-up interview guiding questions	Further guiding questions (if needed)	Connections to the diffusions of innovations theory	Perception (attitude, belief, opinion)	Initial precodes
What are some inappropriate ways you have seen your child using the laptop?	Does this effect the way you think about the laptop program? Do you monitor your child's use of the laptop? How? (If not, then what prevents you from doing so, or why do you choose not to monitor your child's use of the laptop? Does this have any effect on your opinion about the laptop program? Do you talk about this with anyone at home, in your community, or at school?	Relative advantage Social system Persuasion	Opinion Attitude Belief	Training needs Harms Causes of positive opinion change Causes of negative opinion change Neutral Opinions Noneducational uses of laptop
Do you have anything else that you would like to add to this conversation before we conclude with the discussion?				

Yin (2014) states that an advantage of a case study approach is the use of multiple forms of data collection strategies, and that "case study evidence may come from six sources: documents, archival records, interviews, direct observation, participant-

observation, and physical artifacts" (p. 103). This research used documents and archival materials so that facts gathered from sources other than participant reports could identify any outliers or misstatements that were offset by others' views (Olsen, 2012). The materials requested from the school sited included communication sources shared with parents, such as agendas of parent trainings. The use of several data sources helped me to make theoretical connections to Rogers's (2003) diffusions of innovations theory by exploring the communications channels of the parent social system through content analysis of parent communications to see what was said, or not said, about the laptop program. Stake (2010) states that a case study has boundaries with certain components that exist both inside and outside of the system. An adaptable approach, that used multiple sources of data and follow up questions and interviews, was used so that results could be confirmed through an exploratory nature and triangulated data (Olsen, 2012; Yin, 2014).

Recruitment and Participation

Once I obtained approval from the Institutional Review Board (IRB) at Walden University (approval #12-08-17-0161608) and district (Appendix A), I met with the principal at each participating high school to identify staff members who could help identify a pool of parent candidates that could meet the inclusion and exclusion criteria stated previously. These staff members were counselors, parent coordinators, technology coordinators, and others who would have a working knowledge of the parents at each school and the ability to make recommendations to help facilitate the process to recruit parent candidates. I met with each of these staff members to identify where I could place

or hand out informational parent recruitment sheets. I made sure that the identities of the possible parent participants were kept secure and confidential. In order to do this, I made sure that any interested parent contacted me directly or through a locked contact drop box located in the counseling office at each school.

Once I obtained a list of possible parent participants, I contacted each potential participant by telephone to explain the study, gauge their willingness to participate, identify their age, gender, and race, and verified that each one met the criteria for participant selection. I also asked which form of communication they preferred: phone or email. In the case that there would have been more participants than the six to eight required, I would have selected participants based on age, ethnicity, and sex with an attempt to have at least three men and three women, at least two age groups, and at least three ethnicities, as represented by the student population in the selected schools.

After participants were selected, I described to each person – by phone and/or email depending on their preference – the purpose and procedures of this study and acquired a signed consent form from each participant (Appendix B). I contacted each selected participant by telephone to obtain a final confirmation of willingness to participate in this study and their preferred method of communication. I also shared the date, place, and time of the focus group session; and answered any questions.

If some participants withdrew from the study or there were too few participants to help me answer the research question, I would have used all resources to identify additional participants, such as going back to each participating high school to recruit more parent participants to ensure that this case study remained exemplary (Yin, 2014).

Another option would have been to select another high school in the same school district to be part of this study and an additional case would have been created. This scenario did not occur and the original two case study high schools were used for this study. This would have been a viable option and would not have required any additional letters of cooperation. If this option were chosen, I would have had to contact that school's administration, shared my research plan with them, and established that this additional case and additional participants met the focus and requirements of this study.

Data Collection

Data were collected in three phases during this study. First, documents and archival materials were collected from the participating schools and other school community resources that could provide evidence of communication channels with parents. In the second phase, focus groups were facilitated at each participating school. In the third phase, follow-up one-to-one interviews allowed me to further interview selected participants from the follow-up interviews to garner additional data to answer the research question.

In the first phase, I met with the principal at each school to identify staff members who could help locate any documents and archival materials, if any, regarding parents and the one-to-one laptop program. The types of data collected could have been evidence of documentation such as meeting agendas, transcripts of phone call messages, information packets, and letters sent home. I also connected with the parent coordinator associated with the school to collect any artifacts, if any, that they have used to communicate with parents regarding the program, technology training, and anything else

relevant to this study. This phase began just after the initial contact with the school and should lasted approximately two weeks. The evidence was collected in one secure location at each school in file folders in a box organizer.

In the second phase, I facilitated a focus group at each of the participating high schools. This focus group was scheduled approximately four weeks after initial contact with the school. The parent participants were placed in the focus group that corresponded with their child's school. Along with the school principal of each of the participating focus schools, I selected the most ideal location that could be used on the day of the focus group session. This location was the parent center at each school. For each focus group session, I provided light refreshments located on a table that was accessible to and nearby the participants. The interviewing areas contained tables and chairs arranged in a manner so that all the participants and myself were facing each other. I functioned as the facilitator and collected data by audio recording the entire sessions by using a digital recording device. I used a professional transcriptionist company to transcribe the audio. They provided a signed confidentiality agreement (Appendix E). Liamputtong (2011) states that a transcript from a focus group should record everything that was said verbatim and should include identifiers that indicate laughter, pauses, garbled speech, interruptions, and anything else that can provide these essential. The transcripts were checked for accuracy and any discrepancies were corrected. Even though I used a recording device during the interview, this did not eliminate the need to take notes. Creating a transcript allowed me to focus on taking strategic notes during the interview so

that I could formulate new questions, facilitate later analysis, and create a backup in the event the audio recorder malfunctioned.

A one-hour focus group session should provide enough time to allow for the researcher to follow protocol while remaining open-ended and assuming a conversational manner (Yin, 2014). Yin states that each focus group and follow up one-to-one interview in this study should take approximately one hour to maintain focus on the case unless the participants request a longer period of time. The intent of data collection was to gain a rich and deep understanding of parents' attitudes, through the actual stream of questions in interviews should be fluid rather than rigid and is typically referred to as an unstructured focus group (Gubrium & Holstein, 2001). Gubrium and Holstein state that unstructured focus groups allow for the moderator to be flexible with the time and guide the conversation more as a facilitator rather than being tied to the specific questions and structure. In this type of focus group, the participants can have a conversation and talk to each other with facilitator moderation.

All sessions with participants included an exit strategy in which the open-ended question was asked: "What other areas do you have concerns about?" A follow-up question, such as "What are some additional topics, concerns, comments, or questions you may have that you have not talked about yet?" allowed me to ensure that those who were timid and less willing to participate were given the option to add any extra additional information. I also took this time to ask additional questions that I had based on data collected to this point, thank the participants for their willingness and openness in

the participation process, and reminded them that I could be contacting some or all of them for further follow-up interviews.

In the third phase of my data collection plan, one hour follow-up one-to-one interviews were used to further investigate and explore data from (a) participants who I believe had more to say, (b) participants who gave responses that I had questions about, and/or (c) participants that I felt I would be able to dig deeper with to help make connections and patterns, and provide multiple sources of data that could provide a sufficient amount of data for triangulation (Patton, 2015; Yin, 2014). These interviews were scheduled within two weeks following the focus group session. The follow-up one-to-one interviews allowed me to collect even more additional details such as specific examples, topics not thoroughly explored, or themes that emerged from data analysis. Follow up interviews with selected participants took no longer than one-hour in length, as Yin (2014) recommends as needed to adequately solicit and clarify the topics for discussion.

Within two weeks of the conclusion of the follow-up interviews, I provided a copy of relevant sections of the interview transcript to selected individual participants for member checking (Yanow & Schwartz-Shea, 2015). These individuals were chosen because I wanted to make sure that they confirmed or provided edits and/or comments to areas of the transcript the accuracy of which I was unsure. This transcript was shared via the preferred method of each participant, such as by email, paper copy, or audio dictation. I did not have to provide translation services for participants who might have preferred the transcript in a language other than English. I instructed each participant to thoroughly

read the transcript selection and make notes, comments, and corrections directly on the document or on a separate sheet of paper with indications, such as page number, paragraph number, and line number. They returned them to me by the method most convenient to them: email, leaving at the school, or another strategy they have selected. This process did not, in any way, invalidate or distract from the original data, but provided another source of information and confirmation that was used in the analysis phase of the research study (Yin, 2014). The procedure of member checking was used to help to assure content validity and expose any biases that I may have unknowingly or inadvertently portrayed.

Once all information had been received from each participant and no more interactions were needed, I sent each a thank you note with my contact information if they would like to know more about the outcome of the study. I also let each participant know that I would send out a one- to two-page summary of the study's findings and conclusions upon finalization of the study.

Data Analysis

The overarching analytic strategy used in this data analysis plan was the development of a manageable coding scheme based on the data collected during the study. The data analyzed included identified pieces of documents and other archival materials, if any, related to parents and the one-to-one laptop program at each school. It also included the transcripts and notes taken from the focus group sessions and follow-up interviews.

Analysis of documents and archival materials. Document and archival

collection methods were based on a QCA strategy that helped me select the most appropriate documents that reflected the diversity of data collected from the schools (Flick, 2014). As related to the research question, this data contributed context to understanding the perceptions of parents regarding the involvement of their high school-aged children in a one-to-one laptop program in school.

Qualitative content analysis (QCA) was used to analyze the relevant documents that were related to parents and the one-to-one laptop program at each school in this case study (Flick, 2014). QCA requires discovering any material that is in any way relevant to the research question. Such documents could have included those from each school that represented evidence of communication channels with parents, such as parent meeting agendas, parent technology resource handouts, a letter sent to parents, and transcripts of phone calls home. There are often large amounts of material involved in qualitative research and the QCA data analysis strategy directs the researcher to select the material that reflects the full diversity of the data sources. Initial analysis of this data through QCA focused on type of communication, content of communication, details about the laptop program, and any parent directives. QCA involves "an approach to documents that emphasizes the role of the investigator in the construction of the meaning of and in texts. There was an emphasis on allowing categories to emerge out of data and on recognizing the significance for understanding the meaning of the context in which an item being analyzed (and the categories derived from it) appear" (Bryman, 2004, p. 542).

Focus group and interview data analysis. Data were in the form of transcripts and notes from the focus group sessions and one-to-one follow-up interviews. This data

was used to answer the research question about the perceptions of parents regarding the involvement of their high school-aged children in a one-to-one laptop program in school. After receiving participant feedback from member checking, I used NVivo, a data analysis computer software program**,** to upload the data from this study and then link codes to pieces of data. The process of coding within the system helped me find patterns among the data as well as areas that may show that more exploration is needed. Mills, Durepos, and Wiebe (2010) stated that NVivo allows the researcher to reflect on the data and focus on specific aspects of multiple cases using visual displays that are accessible and easy to understand. The data analysis process of coding allowed me to find patterns and triangulate data by finding points of convergence among the different cases as well as within the material documentation.

The data analysis process was started by linking the initial set of precodes to my research question inquiry strategy that I believed the data may be coded (see Table 1). These precodes were developed using literature for this research study and based on theoretical concepts (Miles, Huberman, & Saldana, 2014). They were aligned with Rogers's (2003) diffusions of innovations theory, research questions and subsequent interview and follow-up questions, and perception-type (attitude, opinion and belief).

During the data collection phase, I collected documents, if any, from the schools regarding parents and the one-to-one laptop programs as well as have conducted two focus groups and subsequent follow-up interviews. I used a thematic approach by reading through each transcript and tried to make sense of the data as a group set and search for repeated patterns of meaning (Liamputtong, 2011). I examined the collected documents

and coded them according to the precodes that had already been identified as well as through the creation of new codes that surfaced through this thorough examination. Next, I analyzed the transcripts from the focus groups interviews and coded the data using the previously identified codes as well as any new ones that surface. This process was primarily linear and followed through the data sequentially, but I re-reviewed any sections that were either unclear or contained rich data that called for extra scrutiny. In a similar fashion, I then reviewed the transcripts from the follow-up interviews and coded them using the same procedures as the focus groups.

This research study explored the perceptions that parents have toward the use of a one-to-one laptop program. In the development process of the focus group questions, I categorized a person's perception as a combination of attitude, opinion, and belief. Saldaña (2015) identifies this type of coding as affective coding in which the qualities of human experience such as values, conflicts, emotions, and judgments are categorized. Saldaña suggests to track the journey of emotions evident during the span of the interview to create a storyline of the codes. This is important because there are hundreds of words that can be used to describe any one emotion and it is difficult to summarize the human experience as simple words or phrases. Saldaña also suggests that coding of emotions can be difficult because there are triggering emotions that may precede current emotions such as embarrassment may lead to anger.

Coding related to a person's attitude represents their emotional position about a fact or statement. I carefully listened to and took notes on each participant's tone, pitch, and pacing of their voice, as well as body language, when they spoke about a certain

topic. Opinions were coded by looking for beliefs that may be rooted in facts but are created subjectively and based on experience. I coded the beliefs of the participants by looking for data that indicates the participant's values and who they trust. This data may not be grounded in evidence and participants may not even know how they developed these beliefs. I used my notes from focus group and follow-up interviews, as well as the full transcripts, to identify responses that might have related to one of the predefined precodes that I developed. This served as a starting point and I created more nodes and subnodes to help me make connections, find patterns, and identify outliers. I went back through the data previously analyzed to consider whether there was evidence associated with these added codes.

The use of a data analysis software program helped me save time, manage and organize data, and navigate the difficult process of working with large amounts of data from different sources. I used NVivo, a program to assist with the data analysis, because I have found it useful in prior data analysis experiences and have found that it will allow me to organize, manage, and analyze the qualitative data in the form of written transcripts that will be produced from the two focus group sessions and subsequent individual follow-up interviews. NVivo allowed me to analyze the data in one location using its powerful tools to help draw connects and provide insights. I uploaded the collected documents and interview transcripts into NVivo as internal sources and created the precodes that I defined prior to collecting the data (Miles et al., 2014). As described above, further connections were used to help to define more codes and subnodes that were then categorized and noted. This process of identifying interesting sections of the

transcribed interviews and applying them to nodes was an integral part of beginning to understand the data and, moreover, answer the research question. With or without the use of a software program, my analysis of data focused on the creation of codes and subnodes that were used in the data analysis strategy (Miles et al., 2014).

My goal was to ultimately find convergence of data lines and find patterns and provide triangulation among all data sources. NVivo helped me to organize and analyze the data to draw conclusions that presented an in-depth and insightful description of how parents perceived one-to-one laptop programs. Analysis through coding allowed me to find common themes and patterns across the cases so that I could triangulate and find lines of convergence.

Discrepant cases that did not fit identified patterns and may not have adequately matched any of the codes that I created for this data analysis strategy were noted and used to possibly support rival explanations (Yin, 2014). I reflected on my knowledge concerning these outliers and I used what I learned in the literature review and from the data to attempt to justify their existence. In extreme cases, I contacted the parent participant who provided this outlier data to schedule another follow-up interview so that I could learn more about their perceptions and verify responses. When this occurred, I used the same interview procedures that was used for the former focus group and follow-up interview to maintain content validity and ethical standards. I discussed these discrepant cases with professionals in the field of education in my own learning community and they helped me reflect and devise explanations that I shared in my study report.

Issues of Trustworthiness

The organization of this section includes issues of trustworthiness that establish quality in the study. Credibility, transferability, dependability, and confirmability will each be defined, discussed, and related to this research study. This section concludes with the ethical procedures that I used to ensure the protection of the participants in this study and how I assured the maintenance of their safety, privacy, and confidentiality.

Credibility

The credibility, or internal validity, of my study was supported by findings and matching patterns in the data, exploring explanations to results, being open to rival explanations, and using logic models (Yin, 2014). I used focus group sessions and follow-up interviews to provide multiple data sources to allow any outliers or misstatements to be offset by others' views (Olsen, 2012; Yin, 2014). Triangulation was used in which data was collected from several sources, such as documentation of communication channels with parents, focus groups, and follow-up interviews. The convergence of data was used to determine consistency (Yin, 2014). The set of initial precodes that I created were aligned with the research question, interview questions, theoretical concepts, and perception types. During the analysis phase of this research study, I explored data collected from the focus group and follow-up interviews and connected this data to these precodes as well as made new ones to develop a rich, robust, comprehensive, and well-developed understanding. I sought a convergence of common themes among the different data sources to establish triangulation as well as I analyzed outlier information (Miles et al. 2014; Yin, 2014). Even though multiple participants may

have had converging perceptions and experiences, I ensured that they were not falsely corroborating with each other or basing their responses on misconceptions or misunderstandings. I confirmed understanding through questions that I asked during the interview sessions and I explored justifications and reasons. I also made sure that I was aware of any biases that I had and recognized the unreliability of any method or piece of data. In order to compensate for this possibility, I asked questions that dug deeper, expanded on information provided, sought understanding, and allowed the participants to reflect on the information they provided (Miles et al., 2014).

Reflexivity, the subtle biases that can be produced through forming relationships with the participants, was recognized and reduced wherever possible (Yin, 2014). As a teacher and individual who is social by nature, I enjoy having rich conversations and finding common experiences and attitudes between other people and myself. As a facilitator and mediator in the focus group sessions, I ensured that I provided a comfortable environment that allowed the participants to share their thoughts without allowing myself to express my own feelings or opinions. I undoubtedly formed a professional relationship with the participants during the focus group sessions, and this only increased with subsequent follow-up interviews. This permitted me to create an interview atmosphere in which the participants felt comfortable with sharing their experiences, though I also remained aware of any reflexivity this may have produced. I took notes during the interviews at times when I believed my objectivity was possibly compromised and I reflected on these subtle biases in my journal. I shared my thoughts

and analysis with others in my professional learning community to help me recognize instances where my objectivity may have been compromised.

Member checking was used to rule out the possibility of misinterpreting the meaning of what participants say, which helped alleviate these types of misunderstandings (Yanow & Schwartz-Shea, 2015). This did not, in any way, invalidate or deduct meaning from the original data, but it did provide another source of information that was used in the analysis phase of the research study. The procedure of member checking helped in assuring content validity and exposed any biases that I may have unknowingly or inadvertently portrayed. I did not use member checking after the focus interviews because having participants spend time just to review the transcripts for accuracy places a burden on them in terms of their time and effort, and that outweighed the benefit to be gained by having participants check the transcripts. People do not typically remember exactly what they said in an interview, and so their ability to make any substantive changes to the transcripts would be limited. To be more accurate, and less burdensome to participants, I checked the transcripts while listening to the audiotapes to ensure that everything was accurately transcribed. These interpretations were shared with each participant to validate and confirm them. I also shared the transcripts with those in my professional community who were able to read the transcripts and provide feedback related to credibility and bias.

I did use member checking for each individual follow-up interview because the transcript was short in length and only represented the responses from one individual. I used this data to either confirm or redefine what was learned from the focus group

sessions. This transcript was shared via the preferred method of each participant, such as by email, paper copy or audio dictation. I did not need to provide translation services for participants who may have preferred the transcript in a language other than English. All participants were fluent in the English language, even though a few of them had different native languages. I instructed each selected participant to thoroughly read the transcript and make notes, comments, and corrections directly on the document or on a separate sheet of paper with indications such as page number, paragraph number, and line number.

Because two high schools in the same school district that have implemented similar one-to-one laptop programs were used for this multiple case study, I explored the cases while considering the influence of various school locations and the variation of associated attributes of program implementation. I used pattern matching by predicting the empirical patterns that I thought I was going to find before collecting the data with those that are based on the finding of this case study (Yin, 2014). The patterns that I predicted to find were that (a) parents support the one-to-one laptop program, (b) parents have difficulties monitoring appropriate use of the laptops, (c) parents need additional training and support, (d) parents do not know how their children use the laptops in class and for other educational purposes, and (e) parents who use technology themselves have more positive perceptions toward their children being given one-to-one laptops by their school. The internal validity of this study was reinforced through the predicted patterns that were matched with those found through the analysis of participant data and any discrepancies are explored in the results section of Chapter 4. This ability to engage in

such rich analysis helped me validate the case through a deeper understanding of parents' attitudes and perceptions toward one-to-one laptop initiatives.

Transferability

Addressing the generalizability of this study's findings support transferability, or external validity (Yin, 2014). Gomm, Hammersley, and Foster (2009) state that generalizability in a qualitative case study stems from the idea that the findings represent "a microcosm of some larger system or of a whole society: that what is found there is in some sense symptomatic of what is going on more generally" (p. 99) The participants in this study were selected based on a purposive sampling strategy to represent a wide demographic range of parents and to provide data that was both rich and exploratory in nature. I wanted to be confident in ensuring external validity and that my findings were relevant to others beyond my case boundaries. I want the reader of this study to be able to understand the perceptions of the parents used in the multiple cases of this study, but also to transfer this understanding to parents in their own communities. I included a wide range of demographics, experiences, and backgrounds of the parent participants as possible to collect many different points of view and perceptions. Because this case study was exploratory in nature, I wished to find unique attitudes and perceptions that described the parents' experiences. Yin (2014) states that theory can be used to form the groundwork for making connections and generalizations to the population outside of the participant pool. I used Rogers's (2003) diffusions of innovations theory to find generalizations and patterns among the parent participants in this study by examining

relative advantage, as well as other attribute groups, though I also have an understanding that transferability is limited in a qualitative case study.

Dependability

According to Yin (2014), the dependability of study findings is related to the ability of another researcher to replicate this study using the methods specific to this study's qualitative descriptive case study design. Multiple sources of data collected during focus group and follow-up interviews supported dependability and allowed for triangulation of data. Given (2008) suggests that the research context is open to variation and change. I was aware of change and tracked all distinctions that differed in the actual study from the design in the proposal. I tracked the changes to the research design made necessary by the changing context. These changes included increasing the number of interviews, searching for additional documents in areas other than what was stated in the original proposal, and seeking additional participants in response to what was learned in the focus group sessions. I analyzed the collection of responses from the parents to find converging lines of inquiry, common themes, and corroboration among participant perceptions. This triangulation of data aided in pattern matching and confirmed emerging findings. I followed proper procedures for recording and securing data, coding it in such a way to ensure integrity, and keeping an audit trail in the form of detailed records of the procedures, methods, and decisions made during this study. Data were kept secure by encrypting each file and storing the external drive in a locked location. Data will be retained for a period of at least five years, as required by the university. After this period, all data will be destroyed.

Confirmability

Confirmability was supported in this research by allowing for neutrality and ensuring that the research participants shaped the findings and not influenced by myself, the researcher (Miles et al., 2014). Even though I chose a research topic that was both interesting and motivating to me, I ensured that I was objective and addressed any biases that could have potentially affected the confirmability of this study. I established this objectivity by minimizing reflexivity and ensuring that any subtle relationships that I formed with the participants did not influence my interpretation and analysis of the data. I continually shared and discussed with mentors within my own professional community so that they could provide an additional level of support and critical analysis to ensure the research results were based on data that was garnered from the participants and not biased by my own experiences, thoughts, and values. Triangulation of the multiple sources of data supported the confirmability of this study (Marshall & Rossman, 2016). I analyzed multiple sources of data from the focus groups and follow-up interviews by coding the data and finding common themes that were then cross-referenced with the themes found in a review to corroborate evidence and triangulate the data from these sources. These practices supported the confirmability of this study and ensured research and findings that were professional in nature.

Ethical Procedures

Ethical procedures were followed to protect the human subjects with special care and sensitivity that went beyond the research design (Yin, 2014). This study followed all ethical standards established by Walden University that adheres to U.S. Federal

regulations. There was no intent to harm any parent, student, or teacher. I established protocols to ensure that the safety and wellbeing of all participants were always secured.

The following timeline was followed to ensure that ethical procedures were followed and the participants in this study were and continue to be protected from any harm:

1. I obtained a letter of cooperation from the participating school district that allowed me to recruit and have access to the parent participants in this study (Appendix A).
2. Prior to contacting any participants for this study, I received permission from the IRB at Walden University. Walden University's approval number for this study is: 12-08-17-0161608.
3. I recruited parents with the help of each school's counselor, administrator, and technology coordinator. These staff members directed me to parent meetings where I handed out a Parent Recruitment Letter (Appendix C). I also placed this letter on the main desk in the counseling office at each school. I placed a locked box next to the Parent Recruitment letters so that interested parents could fill out their contact information and place it in this box so that their identity would remain secure and private.
4. I garnered support from the Parent Teacher Association (PTA) as well as worked with school administration to recruit appropriate and willing parents who would like to share their experiences as a part of this study. Parents were directed to fill out their contact information and put it in the locked box on the

main desk in the counseling office so that their identity would remain secure and private. Ultimately, I verified with each school's principal that I had a purposively selected group that would provide rich, relevant and meaningful data. The identities of the parent participants were not shared with school staff and their information remains in a locked cabinet where I am the only person with a key for the five years. After that time, all information and documents will be destroyed.

5. I acquired a signed consent form from each participant that followed the IRB procedures for Walden University (Appendix B). This consent form provided background information regarding the study as well as a detailed description of the procedures that were followed in this study. This letter also addressed and explained the voluntary nature of the study, benefits and risks of being in the study, compensation, and privacy and confidentiality concerns that might have been associated with this study. Each participant, including myself, the researcher, signed the statement of consent provided at the end of the letter of consent to participate in this study. Each participant was reminded that he or she could withdraw from this study at any time and I also provided my contact information to answer any questions or address any concerns later. If there were any participants who refused to participate or indicated that they would like to withdraw from the study, I would have first attempted an intervention plan. This plan included discussing any concerns with them in private, readdressing anonymity and other policies and procedures outlined in the

letter of consent, and trying to encourage continuing their participation in the study.

6. During the data collection phase of this study, I avoided the use of any deception and protect those from harm by following the ethical standards established by Walden University. I also followed the procedures and guidelines detailed in each participant's signed consent (Appendix B). I was cognizant of the emotional well-being of each participant as well as garnered my facilitation skills to guide conversations away from topics that may have been unduly uncomfortable, unsafe, or presented any form of bullying during the focus group sessions.
7. I protected the identity of each participant throughout the study as well as in the study report. The participants in the focus groups may have had some familiarity with each other because they were parents of children who go to the same school. At the beginning of each focus group session, I took some time to discuss with the participants about the anonymous and secure nature of their participation in the study and the requirement that they must not share what they learned or identify any other participant outside the group. I also assigned a pseudonym to each participant so that his or her name will remain confidential. I used these pseudonyms throughout the study. I stored participants' true identities in each participant's file. I will store these files in a locked and secured area for the next five years. After this time all electronic and physical data will be securely destroyed. I also made sure that any data

that I shared with others did not present any identifying information that could have compromised a participant's identity. Each parent participant of the follow-up interviews was offered a transcript of the interview to read for accuracy and I provided my contact information in the event there would be any discrepancies or misunderstandings.

Parents were encouraged to share any general concerns with regard to their participation in the study. Transparency and an open communication system ensured that ethical standards were maintained throughout and beyond the study. Data will be kept secure by encrypting each file and storing the external drive in a locked location. Data will be retained for a period of at least five years, as required by the university. After this period, all data will be destroyed. In cases where a list of names of participants is requested by a school or organization, such as the PTA, I will direct them to the statement of consent that each participant and myself have signed and the policies and procedures of the study in which I have an obligation to ensure that all participants remain anonymous.

Summary

This chapter presented the exploratory case study methodology that was used to explore the parents' perceptions of a one-to-one laptop program using procedures and strategies aimed to provide transparency and reproducibility. The research question in this study required me to investigate the contemporary theme of an educational innovation, thus a qualitative research tradition was chosen to seek this understanding. An exploratory case study using multiple sources of data through focus group and follow-

up one-to-one interviews allowed me to find common themes, compare predicted results with actual findings through pattern matching and find converging lines of inquiry to form triangulation.

My role as the researcher was that of an information gatherer and facilitator. My awareness of any biases that I may have had pertaining to the study was a priority. I have been a teacher and coordinator at one of the focus high schools, and I needed to identify and reflect upon how I would ensure that my ability to remain objective would not be compromised throughout the study, especially during the data collection and analysis phases. Participants were selected through purposive sampling and all efforts were made to find a diverse group of parents who represented different aspects of the general population and their ability to provide deep and rich data. The data collection instrument was a researcher-developed set of interview questions that I created in alignment with concepts from Rogers's (2003) diffusions of innovations theory. Data were analyzed through coding and I focused on finding common themes in parents' attitudes, beliefs, and opinions of the one-to-one laptop program.

This chapter concluded with a discussion of issues of trustworthiness. I ensured credibility and dependability using multiple sources of data collected during focus group and follow-up interviews to provide sufficiency for finding common themes and triangulation of data. Transferability was supported by the selection a diverse group of participants who provide data that went beyond the scope of the study. The biases pertaining to my personal connections to the cases, as well as the reflective relationships that I formed with the participants, were noted and discussed in a journal so that I could

remain objective throughout the study and provide for confirmability. Finally, the chapter detailed the ethical procedures through which I harmed no human subjects. These procedures included a process to inform participants of their rights and the purpose and procedures in this study, as well as information about the statement of consent that protected their rights as well as my own. The following chapter presents the setting, demographics, data collection, analysis, evidence of trustworthiness, and data in relation to the results and findings of this research study.

Chapter 4: Results

Introduction

My purpose in this qualitative, exploratory case study was to examine the perceptions of the parent stakeholder group regarding the involvement of their children in a one-to-one laptop program at two large, urban secondary schools in the southwest United States. The objective of this research was to provide answers about parental perceptions that educational systems can use to this stakeholder group and yield critical funding necessary for the presence of technology in the classroom. A case study design using parent focus groups was used to gain insights about this complex social phenomenon and provide a holistic, real-world perspective from research that was exploratory, descriptive, and explanatory (Yin, 2014). The qualitative research question that guided this study was: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school?

This chapter includes sections describing the setting, demographics, data collection, data analysis, trustworthiness, the results, and a summary of answers to the research question.

Setting

The two high school cases included in this study were in the same large, urban, public school district in the southwestern United States. The two schools were approximately 23 miles apart from one another and were in two different local mini-school districts. At the time of the study during the 2017-2018 school year, both schools were in the fourth year of a similar district-sponsored one-to-one laptop programs

through which the students and teachers were provided Lenovo Yoga laptops to use both at home and at their school.

Even though the demographics at each school varied, they were more similar than different and represented an inner-city population. School 1 had a student population that was about 1,200 students less than School 2. It also had a higher percentage of Hispanic or Latino students (85.5%), English Language Learners (23.5%), and students who qualified for free or reduced fee lunch (84.6%). School 2 was also predominantly Hispanic or Latino (51.5%), but had a higher percentage of African American (25.3%) and White students (16.6%) (see Table 3).

Table 3

Case Study High School Demographics

	Total population	African American	Asian	Hispanic or Latino	White	English language learner	Free or reduced-fee lunch
School 1	1,415	3.3%	2.4%	85.5%	5.9%	23.8%	84.6%
School 2	2,637	25.3%	3.3%	51.5%	16.6%	6.9%	65.6%

Note. From the California Department of Education Dataquest School Data System for the 2017-2019 school year (https://cde.ca.gov).

Demographics

The participants in this study were parents or guardians of students participating in a one-to-one laptop program at one of the case study high schools used for this study (see Table 4). The group of parent participants from each school represented the overall parent population at each school. There were parents from each of the major ethnic

categories as well as across all income and educational levels. I did not find that any of the parent participants represented any extreme or outlier categories.

The names of the participants and schools were assigned pseudonyms to prevent identification. Parent participants from School 1 were named with gender appropriate names starting with the letter "B," and those from School 2 were similarly named with the letter "J."

Table 4

Parent Participant Demographics

	Pseudonym	Net family income	Ethnicity	Age (years)	Education level	Marital status	Gender
School 1							
	Bella	$25,000 - $34,000	Hispanic	35-44	Some college	Married	Female
	Ben	$35,000 – $49,999	Hispanic	45-54	High school	Married	Male
	Bertha	$35,000 - $49,999	Hispanic	45-54	No high school	Married	Female
	Beth	$50,000 - $74,999	White/Hispanic	45-54	Associates degree	Married	Female
	Bill	$100,000- $148,000	Hispanic	45-54	Bachelor's degree	Married	Male
School 2							
	Jane	< $25,000	Hispanic	18-24	Bachelor's degree	Single Guardian	Female
	Jessie	> $150,000	White	55-64	Master's degree	Married	Female
	Jill	$50,000 - $74,000	African American	35-44	Bachelor's degree	Married	Female
	Jonny	$100,000 - $149,000	White	45-54	Bachelor's degree	Married	Female
	Julia	$25,000 - $34,000	African American	45-54	Master's degree	Divorced	Female
	Julie	$100,000 - $149,000	Hispanic	45-54	Bachelor's degree	Married	Female

Each parent group had a range of income and education levels. The School 2 group represented higher levels of income and education levels. The group from School 1

had two males, and the group from School 2 had none. Most of the participants were married. Participants commanded the English language with ease and clarity even though it was not the first language for a few of the participants. There was at least one parent in each focus group who provided more information than requested and tended to dominate the conversation. I used my facilitation skills to make sure that each participant contributed to questions, and I used my set of pre-defined questions as a point of focus and direction.

I also included interviews from staff members at each school connected to parents and the one-to-one laptop program. This group included the administrator in charge of the one-to-one laptop program, parent coordinator, and technology coordinator (see Table 5). Even though these participants were not selected from a pool of candidates, they did represent the range of ethnicities and ages of the parent population found at each school.

Table 5

Administrator, Parent Coordinator, and Technology Coordinator Demographics

	Pseudonym	Position	Ethnicity	Age (years)	Gender
School 1					
	Brent	Administrator	Hispanic	35-44	Male
	Billy	Technology coordinator	White	45-54	Male
	Brenda	Parent coordinator	White	45-54	Female
School 2					
	Jemma	Administrator	Hispanic	55-64	Female
	Jimmy	Technology coordinator	White	45-54	Male
	Jill	Parent coordinator	African American	35-44	Female

Data Collection

As noted in Chapter 3 and following recommendations of Yin (2014), data were collected in three phases during this study. First, the parent coordinator, an administrator,

and the technology coordinator from each school were interviewed and asked to provide documents and archival materials that could provide evidence of communication channels with parents regarding the one-to-one laptop program. In the second phase, parent focus groups were facilitated at each participating school. In the third phase, follow-up one-to-one interviews allowed me to further interview selected focus group participants to garner additional data to answer the research question.

In the first phase of research, after receiving IRB approval from Walden University, I met with the principal at each school to identify staff members who helped me locate any documents and archival materials regarding parents and one-to-one laptop program. The principal at each school suggested that I talk to the parent coordinator and the technology coordinator. Along with the principal at each school, I asked each of these staff members to provide any information regarding communication with parents regarding the one-to-one laptop program. I audio-recorded my interactions with each of them and stored the information that I received from them either in a locked cabinet or in a password protected folder on my computer.

In the second phase, I recruited parents by placing an informational letter (Appendix C) at the front desk in the counseling office and main office of each school. Interested parents wrote their contact information on this sheet and placed it in a locked box located in each main office. Ten parents submitted their contact information from School 1, and eight parents submitted their information from School 2. Parent participants were selected based on their willingness to participate in this study as well as having a child in the one-to-one laptop program for at least six months with at least a 2.0

grade point average. I called each interested parent, determined whether he or she fit the selection criteria to be a participant in this study, and set up the focus groups at each school. The parent center at each school served as the location of each focus group session to provide a comfortable and quiet space that would ensure the privacy and anonymity of each parent participant. The 65-minute focus group at School 1 had five parent participants. The 55-minute focus group at School 2 had six parent participants. The sessions were audio recorded and transcribed using Rev professional audio transcriptions services and a non-disclosure agreement was completed by the transcriber (Appendix E).

The time frame to recruit parents was short and lasted about two weeks because the end of the school year was approaching. This was also a busy time of the school year for administrative and coordinator staff at each school. Available appointments were scarce and quality time with these individuals were obstacles, but I do not believe that they could have influenced the participants or interpretation of the study results. No one at the school sites forced or coerced the parents to participate, all parent participants were amenable to being interviewed in a group, and the site staff at each school were welcoming and supportive of this research study.

In the third phase of data collection in this study, I conducted a 20-minute follow-up one-to-one interview with one parent from each school to collect additional data to help me answer my research question. These interviews were conducted by phone, audio recorded, and transcribed using Rev transcription services. The parent participants for the follow-up interviews were selected following a preliminary analysis of data from the

focus group sessions. I determined that these two parents could provide clarifying information and help me dig deeper into understanding parental attitudes toward a one-to-one laptop program.

Beth from School 1 was selected for a follow up interview because she had two children participating in the one-to-one laptop program at the school and a third child who had already graduated before the school started the program. Because I had already completed a partial analysis of data prior to her interview, I wanted to confirm some of the patterns that I had found, as well as gain some additional insights into anything that I may have missed. From School 2, I chose Jane for the follow up interview because she had a low level of participation in the focus group yet I believed that she had more to say. The questions that I asked her were similar to the ones from the focus group, as well as ones developed to confirm or refute some of my preliminary results.

An unexpected result occurred when I sought out documents, emails, letters home, and/or other informational pieces that could connect parents to the implementation of the one-to-one laptop program. I asked the administrator, parent coordinator, technology coordinator, and even the participating parents for anything that would show workshops, meetings, announcements home, etc. The only documentation that I received were copies of the contract agreement that parents needed to sign for their child to use the network at school and to be issued a laptop used at school and at home (Appendix F). This surprised me because it was my assumption that the schools would have had parent meetings, trainings, and workshops to address the introduction of a new learning tool for their children, the one-to-one laptop. Rogers (2003) suggests that it is interaction within

communication channels that allows for the diffusion of an innovation. I had thought that evidence of communication channels would be in the form of documents and archival materials between the parents and the school, but this was not the case. This allowed me to discover other evidence of communication channels that I identify and explore in the results section of this chapter.

Another unexpected occurrence was that even though I had recruited and scheduled 10 parents at School 1 for the focus group session, only five showed up. At first, I was concerned that I would not be able to collect enough data to answer my question. However, the parent participants were engaged, open to sharing their experiences, and provided a plethora of data that I could use. I concluded that five participants were sufficient, and this data, in conjunction with the data from the other sources, allowed me to find patterns and triangulate data by finding points of convergence among the different cases.

Other than the unexpected circumstances that included a lack of material documentation and a less than expected participant pool from School 1, there were no other variations in data collection from the plan presented in Chapter 3. There were also no other unusual circumstances that were not accounted for in the data collection plan. The plan detailed in Chapter 3 was followed step-by-step to work with each case study high school, recruit parent participants, and follow data collection and storage guidelines and safeguards.

Data Analysis

With case studies, the case serves to reveal understand the relationships within a phenomenon (Yin, 2014). The collection of data through focus groups, interviews, and artifacts were the methods used to collect information-rich and meaningful data in this case study. After the focus group recordings were transcribed, they were coded for relevant concepts, patterns, and themes. This process was completed in the following stages. I first developed precodes prior to collecting data, after which I assigned data from transcripts to these precodes and developed new ones. Finally, I reviewed data and coding to confirm this analysis and make new connections. Saldaña et al (2014) put forth that coding is investigative and exploratory where similar codes are clustered together to develop higher level meanings and propositions. I used the words and statements of study participants from both schools to formulate general conclusions about parents' attitudes regarding the one-to-one laptop program at each of the high schools. I first used the qualitative analysis software program NVivo to upload the transcripts from each case study and code the documents using the precodes that I had developed prior to collecting data: benefit (B), causes of negative opinion change (NO), causes of positive opinion change (PO), communication channels (COM), educational use of laptop (ED), harm (H), information given to parents (INF), non-educational use of laptop (NED), and source of training (T).

The process of analyzing data was iterative. As I repeatedly went through the lines of data in each transcript, I linked quotes with the precodes as well as developed new codes that emerged in the data analysis process. I also tweaked the names and

descriptions of the codes as I deemed necessary to provide a thorough and rigorous data analysis. Table 6 shows the final list of codes with explanations.

Table 6

List of Codes With Explanations

Code	Explanation
Affirmation of Acceptance (AA)	Confirmation of positive attitude toward one-to-one laptop program.
Benefit (B)	Statements that give examples of how the one-to-one laptop program is beneficial.
Causes of Negative Opinion Change (NO)	Statements that indicate what contributes toward a negative opinion.
Causes of Positive Opinion Change (PO)	Statements that indicate what contributes toward a positive opinion.
Educational Use of Laptop (ED)	Ways that parents think their children use their laptop for school.
Fears in the Beginning (FB)	Feelings that parents felt when their child was given a laptop by the school.
Harm and Concerns (H)	Statements that indicate a parent's feelings of concern for how the laptop may be distracting and/or harmful.
Monitor Laptop Usage (M)	How parents check and what their child is doing on the laptop and what they feel about it.
New Ways to Learn (N)	What parents see their children doing on their laptops both at school and at home that indicate ways of learning that are not possible without the laptop or other technologies.
Non-Educational Use of Laptop (NED)	What parents see their children doing on their laptop that is not related to school work.
Smartphone (SP)	Parents' responses that are about smartphones and not the one-to-one laptop program.
Training/Assistance /Support (TAS)	Support systems for parents and/or their children to get help with the use of technology and/or use of the laptops.

As documented in Table 6, the final list of codes that I used to analyze the data were like the precodes, but I did change, modify, and/or delete some labels and I added as new codes to the list. The only code that was not used from the original precode list was neutral opinion (NO). I found that opinions were essentially either positive or negative in nature and this preconceived code could be eliminated. Communication channels (COM), information given to parents (INF), and source of training (T) were merged into a new

code that I created called training/assistance/support (TAS). In the data analysis process, I struggled with the coding related to TAS because I think this topic was complex and not necessarily straight forward. This is further discussed in the results section of this chapter. Harm (H) was another code that was renamed to better describe the data. I changed it to harm and concerns (H) to better describe data such as "I feel like my son doesn't get enough sleep." I concluded that a parent who said that her son was not getting enough sleep because of night time technology use is not necessarily just a harm or a concern. The code harm and concerns (H) better describes the data.

I also found new codes that surfaced beyond the precodes that I developed in the pre-data analysis. One emergent code that emerged was affirmation of acceptance (AA). I didn't expect the parents to be so forward in contributing their positive views of the one-to-one laptop program. Another new code was new ways to learn (N). This code was developed upon finding data that showed parents knew that their children were learning in ways that were only possible with the use of one-to-one technology. Other new codes that were developed included fears in the beginning (FB), monitor laptop usage (M), and smartphone (S). Descriptions of these as well as the other codes are noted in Table 6.

I printed out all the codes with their associated data and manually typed them into a word processing document. This extra process further helped me develop a list of categories that I found through identifying patterns and trends in the data: affordances, monitoring, smartphone, and support (Appendix G). I then shared and discussed these with two professional colleagues and reflected upon a variety of themes that represented the findings of this extensive data analysis. I did not expose any of the participant

identities nor did I share any raw data with my professional colleagues. I went back and forth several times from the transcript data, codes, and categories to find commonalities among responses from the parent participants as well as convergences of data analysis points that rung true throughout and within both cases. No discrepant cases were found among the participants of this multiple case study. Focus group and follow-up interview responses were consistent among the parent participants as well as through the interview responses from the administrator, parent coordinator, and technology coordinator at each case study high school. The multiple case study design allowed for triangulation of data and increased confidence in the results (Miles, Huberman, & Saldaña, 2014).

Evidence of Trustworthiness

The organization of this section details evidence of trustworthiness that established quality in this study. There are four tests to establish the quality of a study: trustworthiness, credibility, dependability, and confirmability (Yin, 2014). Throughout this study, multiple sources of evidence were used to establish a chain of evidence and support the trustworthiness of this qualitative case study. Each section describes how I ensured the accuracy of the findings and quality of the analysis.

Credibility

The credibility, or internal validity, of my study was supported by finding and matching patterns in the data, exploring explanations to results, and finding a convergence of data to determine consistency (Yin, 2014). I explored the data collected from the focus group and follow-up interviews and connected this data to the set of initial precodes that I aligned with the research question, interview questions, theoretical

concepts, and perception types. I also developed new codes to develop a rich, robust, comprehensive, and well-developed understanding. I sought the convergence of patterns and common themes among the different data sources to establish triangulation (Miles et al., 2014). I confirmed understanding through questions that I asked during the interview sessions and explored justifications and reasons. I also made sure that I was aware of any biases that I had and recognized the unreliability of any method or piece of data. In order to compensate for this possibility, I asked questions that dug deeper, expanded on information provided, sought understanding, and allowed the participants to reflect on the information they provided (Miles et al., 2014).

As the facilitator and mediator of the focus group sessions, I made every effort to provide a comfortable environment that allowed me to create an interview atmosphere in which the participants felt comfortable with sharing their experiences. I shared the transcripts with those in my professional community who read them and provided informal feedback to me related to credibility and bias. I used member checking after each follow-up interview to confirm the accuracy of the written transcription of the audio recording.

Transferability

Addressing the generalizability of this study's findings supported transferability, or external validity (Yin, 2014). Miles et al. (2014) states that we need to know whether the conclusions of a study can be generalized and transferable to other contexts. The parent participants in this study were selected because they represented the range of demographics found at each school. I included this range of demographics, experiences,

and backgrounds of the parent participants to collect and represent many different points of view and perceptions. Because this case study was exploratory in nature, I wished to find unique attitudes and perceptions that describe the parents' experiences. Yin (2014) states that theory can be used to form the groundwork for making connections and generalizations to the population outside of the participant pool. I used Rogers's (2003) diffusions of innovations theory to find generalizations and patterns among the parent participants in this study by examining relative advantage, as well as other attribute groups, though I also have an understanding that transferability is limited in a qualitative case study.

Dependability

The dependability of study findings is related to the ability of another researcher to replicate this study using the methods specific to this study's design (Yin, 2014). I used multiple sources of data collected from focus groups, follow-up interviews, and interviews with a school administrator, parent coordinator, and technology coordinator from each case study high school. I used multiple sources of data collected during focus group and follow-up interviews support dependability and allowed for triangulation of data.

I also tracked the changes to the research design made necessary by the changing context. An example of this is a change from what was stated in the original proposal. I had organized a focus group at School 1 with seven parent participants scheduled to take part in the session. Only five showed up, and I anticipated needing six to eight participants. The data collected from the focus group session provided in depth responses

and a substantial amount of information that allowed me to analyze the collection of responses from the parents to find converging lines of inquiry, common themes, and corroboration among participant perceptions. This triangulation of data aided in pattern matching and confirmation of findings. Even though I had one less participant, the data that I garnered from the focus group was enough and enlightening.

I followed proper procedures for recording and securing data, coding it in such a way to ensure integrity, and kept an audit trail in the form of detailed records of the procedures, methods, and decisions made during this study. Data was kept secure by encrypting each file and storing the external drive in a locked location. Data will be retained for a period of at least five years, as required by the university. After this period, all data will be destroyed.

Confirmability

Even though I chose a research topic that is both interesting and motivating to me, I remained objective and met with professional colleagues to reflect on and address any biases that could potentially affect the confirmability of this study. I continually shared and discussed with mentors within my own professional community so that they could provide an additional level of support and critical analysis to ensure the research results were based on data garnered from the participants and not biased by my own experiences, thoughts, and values. Triangulations of the multiple sources of data were used to support the confirmability of this study (Marshall & Rossman, 2016).

I analyzed multiple sources of data from the focus groups and follow-up interviews by coding the data and finding common themes that will then were cross-

referenced with the themes found in a review to corroborate evidence and triangulation from these sources. These practices supported the confirmability of this study to ensure the rigor of the research process and findings.

Results

This research study sought to find the answer to the research question: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school? The purpose of this study was to explore and discover how parents feel about their child being given a laptop by the school to use both at home and at school. Because this study had one research question, this section will be organized by the themes that emerged through a coding analysis of focus group and follow-up interview transcripts. Transcripts from interviews with an administrator, parent coordinator, and technology coordinator from each school were used to corroborate and confirm the analysis and aid in the triangulation of data. The titles for the themes that emerged in this study were inspired by direct statements of participants from the focus group sessions and interviews. The titles of these themes are: Parents expressed loving the program; Parents thought that smartphone issues were more important; Parents valued a centralized technology support system; and, Parents believed that one-to-one laptop programs are the future. The results of this study may be useful to any educational organization looking to implement their own one-to-one laptop program or seeking to make a current one better.

Theme 1: Parents Expressed Loving the Program

The first theme captures an adoring sentiment found woven throughout the discussions with parents regarding how they felt about how the one-to-one laptop program benefitted their children through its versatility, function as a learning tool, and support to facilitate learning. Parents were eager to state that they loved different aspects of the laptop program, and, in fact, they used the word love 17 times throughout the focus group sessions to describe how they felt. One parent's enthusiasm reflects that of all the participants, "I love, love, love that the students have computers," and thus a title for this theme emerged. In this section, I will discuss the affordances that parents think the laptops give to their children and then present how new learning in the classroom provides benefits to parents as well students and teachers.

Laptop as a learning tool. Parents were quick to affirm their approval for the laptop program because they saw it primarily as a learning tool. Beth stated, "I have always loved the laptop." Jonny said, "I've never had a problem with it to be honest," and Bella summed up her feelings by saying, "I love that they have access to technology and that they have the ability to use it." These statements reinforced an affirmation of approval of the one-to-one laptop program as well as parental buy-in.

One component of the love parents expressed for the laptop program was its benefit of access and the learning tool it afforded their children. It was the benefits that helped the parents form an attitude of approval of the one-to-one laptop program and ultimately prompting them to state that they loved it. Ben observed that the more the kids knew how to use the laptop, the quicker and faster they became in learning different ways

to use it. Benjamin substantiated Ben's perception stating that, "students can now take a picture of a page in a book and now don't have to take the book home. This is a great thing because the books are so heavy." Even though Jessie's children had Apple laptops at home, she believed that "getting a PC is allowing them to learn how to use both platforms." Benjamin even saw an unlikely benefit to his daughter being given a laptop by the school. He used to share his own personal laptop with her, and he said that now he doesn't need to share one with her. Jane said that she saw that her son only used his school laptop when he needed to study. He didn't use it when he wasn't studying. Beth agreed and said that her son, a junior, just used his laptop for schoolwork.

Parents also loved that the laptop was a beneficial device that made learning easier and thus helped their children to do better in school. Beth stated that, "The laptop makes everything more efficient for my son. When I was his age, I had to rip up the paper and start over if I made a mistake. The laptop just makes the process more efficient and quicker." Jill believed that the laptop gave her daughter the ability to take charge of everything in her life and that it created a level of independence that her daughter would not have had without the laptop. Beth noticed that the laptop helped improve her son's grades and Beth thought that it made it much easier on both the students and the teachers.

Parents knew how their children were using the laptops for educational purposes, not only at home, but also in the classroom which they had not known before laptops were brought home. Parents loved that bringing the laptop home bridged the learning from classroom to home. Beth stated, "I usually see my son using MS Word – he uses it a lot. He also uses Google to do research and one of his teachers uses Photoshop with the

kids." She also said, "All of them use YouTube. Way more than Netflix. There are so many wonderful things that you can learn on YouTube, but there are also so many other things that you shouldn't be seeing." Benjamin added that he thought that YouTube on the kids' computers was the educational version and that non-educational and inappropriate content was filtered out. Jane saw that her son used the laptop to create PowerPoint presentations, write essays, or look up information and do research on the Internet for his classwork. Benjamin said, "My daughter uses her laptop for research and doing her homework – she goes on to Khan Academy, you name it." Bella added that the students read quickly on the computer, and also used it for math. Julia concurred that her son had the whole math textbook on his computer. Jessie stated, "My son's a ninth grader and uses the laptop for assignments, PowerPoint, write essays, take online tests, and homework. Because its online it's graded right there." Thus, parents showed genuine affinity for the laptops because they supported learning both inside and outside of the school and students demonstrated its value as a learning rather than entertainment tool.

Teachers garnering online classroom management tools. Parents also loved that the that the use of laptops helped their children with homework, expanding learning beyond the classroom which parents got to witness. Their children were able to check their grades online, submit their work through the district-wide learning management system (LMS), and parents were able to log in to see how their children were doing in their classes. Beth made the point that not all her child's teachers were using the laptops and LMS equally. Some were using it much more than others. When I had asked the parents what they thought about being able to see their children's progress online, Beth

added, “I love it! I think it’s great. I wish more parents knew how to use it.” Jill said, “What the kids do on their laptops at a much higher level depends on how tech savvy the teachers are. Some teachers are posting videos of themselves explaining the assignments.” Jessie agreed and said, “The kids are already tech savvy. It really sort of changes the way teachers provide content and interact with the kids.” This is important because the parents showed that they like to be more involved with their children’s progress in class and see real-time lessons as well as assessment information and content. They also liked that their children were able to know how they were doing in a class in real-time as well as know what are the due dates and assignments were in class.

Equitable access. Thus, the one-to-one laptop provided an expanded and equitable learning space outside of the classroom and the parents witnessed this connection between school and home for all children, not just those who had parent-provided devices. Jill stated that even though many of the students had laptops of their own before the laptop program, teachers could not rely on laptop-driven activities because not all students had one of their own to use in class and at home. As an equity issue, she believed that a teacher couldn’t require something from the students if they did not have the resources to access or use it. She added that teachers were now able to change everything they do because the laptops provided so much more than just a book and a pencil were able to offer. Bella stated,

> I didn’t know anything about the laptops at the beginning and sort of feared them. My son wasn’t doing well in school and I decided to observe his classes. My head

was spinning because every single class he was in, he needed and used the laptop.

I had no choice but to get on board with this laptop thing – and I love it now.

Not only were all children provided equal access to learning outside of the classroom, the parents recognized that their child's use of this tool confirmed its value for access to learning for all students.

New ways of learning. The new ways of learning perceived by parents that occurred in the classrooms on the laptops were witnessed just by parents. Billy, the technology coordinator at School 1, said that teachers across his school were doing many amazing things with computers that never could have been done in a classroom without a computer. He has seen teachers send quizzes to the students' laptops and the students being able to answer the quiz easily. The teacher almost instantaneously received different analytics that were provided back to the student. This could never be done without technology such as a one-to-one laptop. He also saw teachers using Khahn Academy, YouTube, and other resources to supplement classroom instruction. Jimmy concurred and said, "the laptop truly inspires new ways of learning and I see teachers totally transforming the way that they teach, and the kids love it and are engaged and excited. Not every teacher is doing it, but I see some traditional teachers slowly starting to get on board – and they're loving it." This shows that what parents observed in their own children's classrooms was happening school-wide.

Access to learning even through non-educational use. Parents loved the laptop program even though they recognized its potential for distraction. When the parents saw their children using their laptops for non-educational purposes, they consistently

mentioned Netflix and YouTube. Although these uses of the laptop could be seen as entertainment rather than educational, parents saw a benefit and relative advantage to these non-school related activities. Julie stated that she saw her son watching a lot of Netflix. He even told her that all the kids were watching Netflix at nutrition and lunch time almost all the time. Beth said that she saw her son using YouTube way more than Netflix, but added that there were so many wonderful things to learn on both even though many parents and teachers could think of them as distractions. The parent's perception of the laptop's relative advantage of potential learning is one of the reasons that supported the parent's positive attitudes and adoring sentiments that they felt toward the one-to-one laptop program.

Parents loved the idea that even when their children were using the laptop for non-educational purposes, they were also learning about how to find information and access resources. Benjamin said that his daughter even learned how to braid her hair by watching videos on YouTube. Beth said, "the thing is too, watching shows, it doesn't matter what the show is, whether it's supposed to be educational or not, you're gonna learn something." Benjamin said that his daughter has not learned Spanish at home, even though it's his first language. He brought up the point that even the Netflix videos that she would watch on her laptop could be used for learning sharing that she watched Colombian tele-novelas to do something that he was unable to do: teach her the Spanish language. Even though the laptops provided access to a world of resources both educational and entertainment oriented, parents saw the value of something being learned by their children even when it was not related to the classroom. This result is similar to

Pereira's (2016) and Vittrup et al.'s (2016) findings that parents believe that computers and Internet access should be available in schools even though there are risks of certain threats such as access to entertainment and other diversions. Even though these studies involved students from the primary grades and parents from a more affluent and educated demographic group, it is demonstrated that parents value the use of and access to digital technology in schools.

A discrepant case that I found was with Julia, an immigrant from Africa who self-labeled herself as very traditional and not technologically savvy. Her positive and loving views of the laptop program were undeniable, but she failed to see many positive aspects of the laptop for uses other than for schoolwork. She said, "It's just wasting time in my opinion. If you want to use the laptop for pleasure get the work done first." She admitted that her son listened to music while doing chores and homework on the laptop, but her opinion was that the laptop should be more confined to the classroom.

Parent's expression of acceptance indicates their belief in the relative advantage of the innovation (Rogers, 2003). Relative advantage is the degree to which an idea is perceived to be better, more efficient, and easier to use. There is evidence that relative advantage was perceived by the parents because they expressed a positive attitude toward the one-to-one laptop program and they felt like it provided benefits both academically and socially. Parents didn't even mind that their children used the laptops for non-school related purposes such as watching videos on Netflix and YouTube. Parents saw that their children were learning differently on the laptops and were more able to manage their learning, and that added to the relative advantage that the one-to-one laptop program

provided. The laptops provided new ways of learning and doing things and parents expressed love that the school has provided their children one to use at school and at home.

Theme 2: Parents Thought That Smartphone Issues Were More Important

While parents expressed an overwhelming and eager approval of the one-to-one laptop program, any source of frustration with technology misuse and distractions had little to do with the laptops. The title for this theme came from a comment that Jill made when asked about the harms that the one-to-one laptop provided. She stated, "It isn't the laptop that's the problem, it's the smartphone." This sentiment provides the foundation for Theme 2 which is the technology that they reported to be the sources of most of their frustrations and discontent – the kids' smartphones and their excessive, inappropriate, and problematic use.

In a discussion regarding the perceived harms of the laptop, parents were quick to direct the conversation toward the smartphone use. Julie could not think of a problem with the laptop, but stated, "My son is so addicted to his phone and videogame device. I also see this with his friends and classmates." Jonny said that he didn't like it that his son doesn't get enough sleep because he was on his phone playing video games all night. Beth said that her son would sneak out of bed in the middle of the night without her knowledge to play video games on his phone or game machine. Julie went a step further and said, "Take away the smartphones. There's an addiction issue." Even for children who like to listen to music and use social media apps, Beth said that children would much rather use a phone than the laptop because its faster and easier to use. Beth had noticed

that many children just wanted to play on their phones and only used the laptops for school stuff. Bella said that her son gave her so much frustration because it seemed that all he wanted to do was play videogames on his phone. Ben concurred that his son constantly wanted to play videogames on his phone. Parents' consistent frustrations about technology use was not from the school-distributed laptop, but rather their child's own smartphone suggesting that the parents were not necessarily afraid of technology or the devices, but rather how they were used and to what online materials their children had access. Parents showed that they were worried about the possible addiction to technology and the negative consequences that this may offer.

For some parents the phone represented not only the path of least resistance to possibly inappropriate content, but also to distractions. Benjamin said, "I think we should be more worried about what they actually have access to on their smartphones." He added, "My daughter, she's more able to get distracted by things happening on her phone than on her laptop." The parents agreed that the smartphones did not have any filters on them, or they did not know how to use them if they did. Ben adamantly believed that the phone is a big problem. Beth said, "I find that the kids are not as savvy today as they were three years ago, it's like flip-flopping because everything is so convenient on the phone. The smartphones are easy, the computers they are used for school." This shows that parents have recognized that their children were becoming easily distracted by merely having their smartphone accessible and that was one of their major concerns.

The parents' consensus about the phone as a distraction was corroborated by, Billy, the technology coordinator at School 1. He said,

> I find that every room I go into at school, many of the students are on their smartphones. I mean Instagram, Snapchat, music, headphones, movies…all that stuff. The only difference is that our laptops the kids have are being filtered and monitored. They're managed by our tech team at the district level. So, they can't just go onto Netflix during school time on their laptop and watch shows all day. But their cell phones are probably where they want to do all the fun stuff. They probably just use their school laptops for school – for academic stuff. It's not the laptop that causes most of technology distractions in classes, it the smartphone! It's the smartphone that we should be concerned about.

Brent, the administrator in charge of the laptop program at School 1, also said that when he walked around the school and peeked in classrooms he saw that almost every child had a smartphone. He noted that some of the children used their phones for schoolwork, but most of them were distracted by listening to music, participating in social networking on them, or using many other non-academic apps. Jemma, the administrator at School 2, noted that she had seen the laptops used mostly for writing papers, doing research, and connecting to the learning management system that was used district-wide. She also believed that smartphones have been a distraction both in class and basically everywhere else. Whether in the classroom or at home, both parents and school leaders have not come up with a plan to address this issue of inappropriate use of the smartphone. Thus, the smartphone and not the one-to-one laptop was a source of distraction both at home and school.

Parental support of laptops over phones as supportive to learning may have been a result of school constraints related to device management. The school laptops had filters and safeguards that monitored and protected what the students had access to on the computers whereas smartphones were unfiltered and open to anything the children wanted to do on them. Zheng et al. (2016) found that the implementation of the one-to-one laptop program may not have the intended consequences of increasing students' on-task device use during class time. These examples justify the reasoning as to why change, according to Mitchell, Parlamis, and Claiborne (2015), has been slow and has often been met with conflict and ambivalence regarding the use of digital technology because some technologies have been a distraction to learning.

Theme 3: Parents Valued a Centralized Technology Support System

The core resource for managing, implementing, maintaining, and problem-solving for the one-to-one laptop program for all stakeholders was one person: the technology coordinator at each school. Following the data collection plan set up in Chapter 3, I asked the schools for documents in the form of agendas, meeting notes, flyers given out to parents, and others that could provide evidence of communication channels with parents. I thought these materials would have been used to provide assistance and guidance with the introduction of the one-to-one laptop program. As reported earlier, I found out that these documents did not exist. The schools offered no parent meetings or workshops. The only document that I found from both case study high schools was the District Acceptable Use Policy for Technology Use (see Appendix F). However, each school had a technology coordinator who served as a centralized technology support system and

singlehandedly addressed each parent's needs as well as the needs of all other stakeholders.

Technology support for all. There was one person at each school who served as a one-stop-shop to help students, parents, teachers, and other staff members with real-time issues that could be solved in the moment. At School 1, the technology coordinator, Billy, served as this main point of contact that everyone used for help, direction and problem solving. Parents reported consistently that whenever anyone needed help, support, or assistance at School 1, everyone just said, "Go see Billy!" A similar pattern was found at School 2 in which everyone was just directed to their technology coordinator, Jimmy.

Technical support offered informally or on demand to students was also available to parents and other stakeholders. Billy, the technology coordinator at School 1, reported, "I have always been open to seeing parents. If this system wasn't working, then I know we'd have thousands of unhappy parents knocking on our doors for help." As evidence of Billy's effectiveness, Janet, a parent coordinator, said that the parents at her school had not been asking for help with the laptops and she had not had any complaints about the program from the parents. Janet said, "We have a technology coordinator at school that's paid to train the students on how to use their laptop and provide support. This person mainly supports the students directly, but also helps everyone else too – the teachers, the administrators, the parents, and me." It was evident that the technology coordinators were a critical system of support that was set up to provide a wide range of assistance with the one-to-one laptop program for the entire school community.

Parents not asking for training. Support for the parents was not designed or systematically provided by the schools. While Brenda, the parent coordinator at School 1, stated that the one-to-one laptop had been successful, she at first thought that providing workshops to the parents was going to be critical. What she found was that it was difficult to get parents to come in for workshops on technology. At the first workshop she offered only three or four parents attended. The second workshop never happened. She reported that parents really were just wanted to learn the basics of how to use a computer for themselves, but didn't really feel like they would ever get to a point where they would understand, or need to understand, what their children were doing on their laptops or other technologies. I found a common thread across parents at both schools. They didn't think that they would ever be able to help their children on the laptops and no number of workshops or training materials would help.

Bella perfectly summed up what most of the parents had felt by stating, "the district is doing a good thing giving our kids laptops because we didn't have them when we were little. We didn't learn that way. Now we've barely learned how to swim and they are already swimming." Ben concurred and said, "You know, they're more advanced. I mean, we are very low and they are on the top of the mountain." This shows that the parents have identified that they are not the ones who were able to provide support for their children's technology needs and that no number of trainings, meetings, or support materials would get them up to the level that they would need to help their children learn using technology.

There were no negative comments that I found that parents had with regard to being able to get help with the laptop program, and, in fact, they all knew that each school's technology coordinator was an effective go-to resource for help and support. This suggests that the parents did not desire to be trained or empowered in helping their own children with the one-to-one laptop, but rather they had all shown comfort and trust in the one resource that the school has provided: the technology coordinator.

Student technology support. While parents were not intentionally or strategically provided with supports, both schools enculturated students about how to get technology assistance from each school's technology coordinator that eventually trickled down to parents. Parents were not directly instructed to go to the technology coordinator through formal messages, they found out about this resource through several communication channels: the parent coordinator in the parent center, staff in the front office and counseling office, other parents, and their own children. When Beth, who spent a lot of time in the parent center at school, said that every day, "kids hear the announcements…to take their computers to Billy, the technology coordinator, to get them looked at or taken care of." All parents confirmed that they knew who Billy was and that he was the person at school to help with the one-to-one laptops. Ben said that he came in once to talk to Billy to get help with getting the laptop to work on his wi-fi network at home. Another parent said that when her son had a problem on his laptop, Billy was able to fix it in about five minutes. Bella said that that there was only one Billy for the whole school and that he was working out "pretty well." Ben said, "In my case he works out very well."

Once support was provided by the technology coordinators to stakeholders, these individuals, primarily students, then disseminated what they had learned to other stakeholders. Billy stated that he could get a student trained and a computer fixed in a few minutes and found that after he trained a student how to do something, that student went back to class and showed everyone else. Jimmy emphatically stated, "We are a wonderful community here and our support system works. The parents – they have nothing to worry about." Reinforcing Jimmy's comments, Billy said,

> For the most part, the parent doesn't need to be here to take workshops and learn about the laptop program because we work directly with the students. If any student has a problem with the laptop, he'll just come in and talk to me and I'll show the kid how to fix it or use the program. I have found that if a parent doesn't know technology that it's the student who then goes back home and teaches his parent. This is kind of backwards. The solution is that we teach the kids, support them, and then they teach the parents at home. Over the last two years I have seen literally four or five parents. Other than that, the schools, the district, me, the technicians on site, we take care of everything. The system of support that our district set up for all our one-to-one schools works.

Confirming the diffusion of knowledge, Brent, the administrator in charge of the one-to-one laptop program at School 1, said, "Parents and everyone else go to see Billy if they need help. He's in his room during every 14-minute mid-morning break and 30-minute lunch. If he's not there, then I take on that responsibility – something I don't have any

time for." Jemma, a school administrator at School 2, said that they have never had a workshop or training for the parents – they have Jimmy.

Communication channels. The role of support in this case was related to one person, at least as reported by parents. This is what Rogers (2003) calls a communication channel, which is a factor that helps in the diffusion of an innovation, discussed later in this section. Billy, the Technology Coordinator at School 1, described his work as consistent and offered as needed. He stated, "On an average day I troubleshoot numerous student laptops from students ranging from passwords that don't work to broken laptop screens to reissuing new laptops for students." While Billy felt he was able to manage everything, he said "The job *is* too big for any one person. The thing is that you don't have to do it all at one time. All our software and apps are working which is a big win." Even though Billy was only one person, the students were being supported and a breaking point had not yet been reached.

Evidence of diffusions of innovation (Rogers, 2003) was clear as parents came to accept the laptop program. The theme of a centralized technology support system represents the communication channels and communication system that the District has set up to ensure success of the one-to-one laptop program. The technology coordinators served as direct communication channels for both parents and students. This means that the technology coordinator was the conduit for providing communication in the form of support and assistance with the parents and all other stakeholders. This result aligns with Baran's (2016) findings that ongoing technical support is necessary for the success of technology programs in schools. Baran's study focused primarily on teachers and

students, and my findings add that the parent stakeholder group can also benefit from similar technology supports.

Theme 4: Parents Believed That One-to-One Laptop Programs Are the Future

Parents believed that one-to-one student laptops are tools imperative for success in the 21st century and not just replacements for textbooks. Parents felt that once their children were given laptops to use both at home and school they couldn't imagine an educational experience without one. This theme reveals how technology served as a fundamental and equalizing strategy to better prepare citizens for future participation in society. The idea of the tool "as a basic human right" was explicitly stated as essential to participation and future success for all students.

During the introduction of the one-to-one laptop program parents reported a variety of concerns. Jessie said, "because this is a test, if they start to get teachers and students to use this technology, what if they decide to take them away because the District can't afford it and decide not to do it anymore?" Jessie added, "this laptop program is great because it gives computers to kids who wouldn't otherwise have one – it evens the playing field." Jill agreed saying, "Yes, and offering a laptop to a family who has never had one before has the ability to start changing their culture and how they do things." Brent, an administrator, agreed with parents saying, "I think that the one-to-one laptop program is great. It helps the students, especially the ones that don't have any technology at home." What parents once saw as a nice piece of technology for just their own child turned into something that was considered a basic need for all children, especially those who did not have access to one at home or at school. Quite possibly, the

laptop has become a basic human right for all high school students preparing to enter the workforce and participate in society as an adult.

The parents believed that the laptop was also a basic need for getting their children ready for the jobs of today and tomorrow. Jane said,

> The world is more computerized with computers everywhere. Having my child using a laptop in school is a good thing for him to learn how to use it in school – it's critical to his future success that he learns this.

Billy, the tech coordinator, said,

> …laptops should be in every school because in this day and age you cannot survive without some sort of technology. Most jobs you need to know how to use a computer. I think it should be a right that every student has a laptop.

Other parents concurred, including Benjamin who said, "Most jobs require you to use a computer, regardless of where you work at. It's important that our kids have the ability to use technology in a professional way so that they can get further in life." Jessie elaborated associating his own fear with the necessity of computer skills. "I'm afraid of computers, but being out in the work world now and not knowing how to use one – Where our kids gonna be?" Parents recognized that computer literacy was a portable skill that their children could take with them to be successful in any career that they chose.

Parents saw laptop programs as an effective recruitment tool by schools when parents choose what high school their child would attend. In this large urban school district, parents had the choice to send their children to high schools either in their local community or across the district. This occurred through school choice permits for

families who lived in areas with low performing schools, permits for magnet schools, and various special program permits. Johnny said, "When we were touring possible schools, I noticed that all the private schools had one-to-one laptops. Choosing to come here, a public school, would have been much more difficult if you didn't offer a laptop for my child." Benjamin also saw the laptop as an economic advantage.

> When I found out that my daughter was going to get a laptop as a freshman I thought to myself what a great idea that is and it will be one less expense for me. Laptops should be the normal now!

Even for parents who could afford a laptop, there was a sense of comfort in knowing that their children were attending a school that not only distributed laptops free of charge, but there was a mission to use and support technology in the classroom schoolwide. For the laptop to be considered a right of all students, the support and structure needed to be in place and the parents have recognized that their schools have taken on this challenge.

Parents, no matter what their socioeconomic situation, were aware enough to think that a one-to-one laptop program is a way that schools needed to market themselves. They wanted this for their own children and for those of every other parent at the school because they knew that their children needed these skills to be able to be successful and independent citizens of a highly technological world. Billy, the tech coordinator, summed it up by saying,

> Technology isn't going anywhere. You have to have one-to-one laptops integrated into a school. Now, I can't see it otherwise. It's like providing desks, chairs,

water, books, and bathrooms. The laptop is becoming a basic human right for all students.

Summary

This study sought to answer the research question: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school? The purpose of this study was to explore and discover how parents feel about their child being given a laptop by the school to use both at home and at school. The themes found in the analysis were: Parents expressed loving the program; Parents thought that smartphone issues were more important; Parents valued a centralized technology support system; and, Parents believed that one-to-one laptop programs are the future.

The results of this study indicated that parents saw the relative advantage (Rogers, 2003) of the one-to-one laptop program, their concerns were not directed toward the laptop but rather their children's persistent use of their smartphones, a technology coordinator was a center of support and what Rogers (2003) calls a communication channel for themselves and their children, and finally, the parents perceived the one-to-one laptop to be a basic right for all students. The findings revealed new contributions to the study of parental perceptions of a one-to-one laptop program. I found that a central school-wide technology support system to all stakeholders, including parents, is critical to the success of the program and approval by parents. Parents were not necessarily seeking self-learning to help their children with their laptop technology needs. They

found comfort in the fact that they knew where to go for help for themselves as well as their children.

Chapter 5 includes a discussion interpreting these findings, provides recommendations for future research, describes the limitations of the study, and details the study's implications related to social change.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

My purpose for this qualitative, exploratory case study was to examine the perceptions of the parent stakeholder group regarding the involvement of their children in a one-to-one laptop program at two large, urban secondary schools in the southwest United States. A case study design using parent focus groups, interviews, and archived materials was used to explore this complex social phenomenon to understand the perceptions of parents. The findings of this study can be used by those in the education community to make informed decisions in the development of one-to-one laptop programs or to provide insights that can help to make ones already implemented more successful. Parents are critical stakeholders in schools and it is important to understand their perceptions on educational programs, especially ones like one-to-one laptop programs that are costly and have the ability to bring the traditional classroom into a more technical and connected landscape.

This chapter provides a discussion and interpretation of the research study findings in relation to the conceptual framework and literature review found in Chapter 2 followed by a discussion of the study's limitations as well as its methodological, theoretical, and social implications. This chapter concludes with recommendations for future research and practice.

Interpretation of the Findings

Benefit of Technology to Learning

The study indicated that parents knew how their children were using the laptops for educational purposes, not only at home, but also in the classroom which they had not known before laptops were brought home. Prior research has documented that students who use one-to-one digital devices as a part of their educational experience benefit from the experience (Crook, Sharma, & Wilson, 2015). Parents corroborated the findings of Islam and Andersson (2015) and Nelson et al. (2016) that due to the ubiquitous nature of technology, it comes as no surprise that schools nationwide continue to integrate technology into the classroom as tools as systems evolve. Parents also corroborated the findings of Bousbahi and Alrazgan (2015) that the new technology learning tools have birthed new teaching and learning strategies, requiring teachers and students to adapt not only to changing technology but also to changing instructional practices. Consequently, the parent participants in this study recognized the value, adapted to, and loved what the one-to-one technology has brought to their children's educational experience. In relation to Rogers's (2003) relative advantage, parents confirmed that laptops were more advantageous for learning at home than were other learning tools such as textbooks and even smartphones.

Affordance Versus Distraction

The study indicated that parents loved the educational benefits that the laptops provided, but were frustrated with the distractions, especially those provided by smartphones. Parental approval reflected findings from prior research. Pereira (2016)

found that parents believed that technology can have a positive impact on their children's lives, and the frequent use of technology aided in students' learning processes. However, Pereira also found that parents were concerned about their children's access to inappropriate content and growing dependency on technology, which, consequentially, subtracted time from healthier activities, such as playing outdoors or reading. Johnson (2014) also found that parents struggled with managing their children's use of technology as an educational tool and as an entertainment device. My finding confirmed that the smartphone was a distraction and parents found that its excessive use interfered with sleep time, study time, and family time reflected in prior research (Amaechi, 2016; Johnson, 2014; Vittrup et al., 2016).

Policy and Management

The study revealed that parents recognized that the one-to-one laptops were equipped with an effective device management system that provided security blocks that their children were not able to get around. These district policy and management measures provided laptops that parents felt were ideal for academic purposes and most features that provided non-educational entertainment were blocked or restricted.

Conversely, research has revealed a lack of enthusiasm toward putting a digital device into the hands of every student. In the case of the LAUSD iPad program (Dobuzinskis, 2013; Zhu et al., 2014), the acceptance toward technology use in the classroom was challenged by its perceived lack of usefulness by teachers, parents, and administration in part because of the policies directing the program and the management of the devices. In comparison to the one-to-one laptop program used for this current

study, the iPads that were part of the LAUSD one-to-one program were found to have back door unrestricted access to inappropriate content and entertainment that students were able to easily find and circumvent. Due to the inability of the district to properly manage these devices, parents and administrators demanded that they were immediately taken away from the students. This finding confirms the limitations found in the Dubuzinskis (2013) study of the LAUSD iPad program and that parents are a force not to be reckoned with. The relative advantage (Rogers, 2003) found in the current study provided a benefit to the parents that the iPads and other technologies such as smartphones could not.

Effective Communication Channels

Rogers (2003) stipulated that it is interaction within communication channels that allows for the diffusion of an innovation within a social system. As per this study's findings, data in the form of communicative documents and other disseminated materials did not exist in the form of a communication channel. However, the central school-wide technology support system—in the form of the technology coordinator—to all stakeholders, including parents, was critical to the success of the one-to-one laptop program and approval by parents. Reid (2014) found that institutional technology support to teachers was critical to the implementation and continuation of technology programs in schools. The findings in this study add to Reid's study that a broader stakeholder base beyond the teacher group can benefit from these communication channels.

The One-to-One Student Laptop as a Future Reality in All Classes

This study indicated that parents believed that one-to-one student laptops should be used in all future classrooms. Previous studies confirm this finding. Rosa (2013) suggested that digital technology inclusion in the field of education is a social right and must become the primary focus of public policies informing educational practices. In this study parents clearly stated that the one-to-one laptop should be a basic human right of all confirming the social need for students to have access to a personal device regardless of a parent's ability to afford or support it. Parents saw technology to be a right of all students similar to the provision of books, desks, and chairs.

While findings from my study confirm prior research indicating that students can improve their technology skills through frequent technology use in school (Barrett, Moore, & Slate, 2014), there is a persistent knowledge gap between students with and without access to technology at home. Lack of access to digital tools and resources at home can hinder the prospects for students, whereas early exposure in school can reduce the gap in children's computer skills at an early age. The parent participants in this study acknowledged this gap and had the belief that a one-to-one laptop program had the ability to narrow this gap and ultimately support and benefit not only their own children, but also all students at their school. Barrett, et al. (2014) found that helping students from high-poverty, high-minority elementary schools by providing access to digital technology is critical to closing the digital divide. In addition, the parents in this current research study also believed that closing the digital divide was not just something that benefited less fortunate students, but also contributed to their own children's success.

Limitations of the Study

There are four limitations found in this qualitative study of parent perceptions toward a one-to-one laptop program. The first limitation stems from the use of focus groups as the primary source of data collection. The small sample size of the parent stakeholder group is the second limitation that I have identified in this study. Time is the third limitation and researcher bias contributes to the fourth. This section will describe these limitations with a focus on issues of trustworthiness.

Focus Groups Not Standardized

Focus groups with parent stakeholders from the two case study high schools provided rich data that helped me answer my research question in this study, however, this technique did not provide a regulated or consistent method of questioning. Vicsek (2010) states that the use of focus groups in a qualitative study is a limitation because the format of the questioning is not standardized and may transform according to individual situations that emerge through discussions with the participants. For both focus groups, I used a set of questions that were predeveloped and used to keep the conversations on track. While I used this full set of starter questions for each group, I allowed diversions in the discussions to reflect the participants' diverse experiences, attitudes, and opinions. Thus, the implementation of the questions varied among groups.

Small Sample Size

The parent stakeholder group participants were a small sample selected based on student participation in the program and not on parent characteristics alone. However, this sample was not representative of all parents at each school, even though the selected

parents represented a wide range of demographics and backgrounds that may be found in many schools. This helped to achieve as much transferability as possible on behalf of the study (Yin, 2013, 2014).

Limited Time Frame to Conduct Study

Time was also a limiting factor in this study. Due to the nature of this study of parent perceptions of a one-to-one laptop program at two high schools, I had to schedule my focus groups and individual interviews within a set span of time over the course of one semester and with individuals who were busy with work and family obligations. I addressed dependability for this research study using multiple sources of data to collect information during the focus groups and follow-up interviews that allowed for triangulation of data (Yin, 2014). The limitation was the amount of time that I had to garner data from the participants, and the participants' ability to be as honest and candid as possible within in a limited amount of time.

Researcher Bias

There was the possibility that I could have exhibited my own biases due to personal experiences with technology use as a student and in my role of teacher in a high school in the same district used in this study. To counteract this, I pursued all efforts to reduce these biases, such as sharing my work with mentors and advisors, as well as taking notes and reflecting on any act that may not be neutral and objective (Yin, 2013

Recommendations for Further Research

Educational organizations interested in implementing a one-to-one laptop program or ones who would like to improve a current program may be especially

interested in the findings. This study begins to fill the gap in the literature regarding parents' perceptions concerning their high school students' use of technology in a one-to-one laptop program for in-school and at-home educational purposes, and researchers interested in this topic should be able to use these recommendations to inspire their own research to further contribute to close this gap. To confirm the findings of this study and further explore parent attitudes toward one-to-one laptop program, this study's replication in other similar programs in other schools and districts can help understand this complex and important topic.

The study indicated that parents had an overwhelming positive attitude toward the one-to-one laptop program because of a relative advantage (Rogers, 2003) that was formed by the many benefits that these devices provided, but further studies can contribute to the generalizability of this finding. Future research should explore parental positive attitudes about mobile technology. It remains unclear how children's laptops may be a more academic tool rather than an entertainment device such as mobile phones which were seen to be a distraction as found by Amaechi (2016). Further research can examine how and why home use of smart phones have been successful as learning tools when used outside of school and how different stakeholders have supported such efforts.

Because my findings indicate that content filters and device management of the laptops by the district were effective in transforming the one-to-one laptop into a more academic device, further research is needed to find out if those same restrictions could render the smartphone as a technology that lessens parent frustrations toward their children using them. Further research is needed to study parent perceptions toward a

variety of one-to-one laptop programs that are managed differently with similar devices as well as others such a iPads, Chromebooks, and MacBooks. My findings also suggest a need for further research of school and district policies regarding laptop use and the inclusion or exclusion of device management systems. This may help administrators understand the connections among device type, device management, and one-to-one program implementation.

This study found that parents were aware how teachers were adapting and transforming their pedagogy and saw that this benefited their children's academic experience. This study did not examine how teachers were using technology in their own classrooms. Further research should examine if there are is a connection between how a teacher uses technology in the class and the parent perceptions toward the one-to-one laptop program. Future research should explore the beliefs of teachers, students, and parents toward the use of technology in education as well as for non-academic purposes to help us further understand these complex connections and how they relate to student achievement and learning. The parent participants in the current study had a positive attitude toward the one-to-one laptop program, but further research is needed to study the perceptions of parents who have children at schools that have implemented their one-to-one laptop programs in their classrooms in a variety of ways from non-use to total transformation.

A central school-wide technology support system—in the form of a technology coordinator—for all stakeholders, including parents, was found in this study to be critical to the success of the one-to-one program and approval by parents. Even though training

was offered, but not used by parents, parents expressed a need for support, as did school staff. Offering systematic technology to support through one centralized office is one way that a school can provide support, but further research is needed to explore other cases representing a variety of support systems beyond having one technology coordinator who serves as the sole system of support for all stakeholders, including parents.

The literature regarding technology use in schools suggests that digital technology inclusion in the field of education is a social right and must become the primary focus of public policies surrounding education (Darling-Hammond, Zielezinski, & Goldman, 2014; Rosa, 2013; Voogt et al, 2017). Parents in this study felt that the one-to-one laptop at their children's school was a necessary educational tool for all students, including those who cannot afford one. This idea of a one-to-one laptop or other digital device becoming a human right for all students is not so farfetched. Further research is needed to verify the finding that parents believe that the one-to-one laptop should be a human right for all students. This further research can also explore the views of teachers, administrators, students, and other academic stakeholders toward the one-to-one laptop becoming a required digital device in the hands of all students in schools, just like books, paper, and pencils.

This study found that parent perceptions of a one-to-one laptop program were important to its implementation, but these perceptions did not suggest whether the program was successful or not. As a continuation of this study, further research is needed to measure how parents' attitudes reflect program success to help stakeholders in education make better informed decisions. This study also suggests that parent buy-in is

important and further research is needed to understand their engagement, as well as that of other stakeholders, as decision-makers in the process of implementing technology programs in education.

Implications

This research study that explored parents' attitudes toward a one-to-one laptop program has provided not only insights into how this stakeholder group feels about their children being given a laptop to use both at home and at school, but also presents findings that can have implications on future implementations of these programs. There is a potential impact for positive social change at both the local school level and the technology decision-making bodies in educational organizations at all different levels from state and federal departments of education to local boards of education to charter school boards. Findings showed that parents loved and accepted the one-to-one laptop program and the findings can be used to help educational organizations looking to implement their own one-to-one laptop programs or those who want to make current ones better.

One-to-one laptop programs are complex and require a significant amount of funding for resources, upgrades to current infrastructure, and additional personnel to design and manage the program. Awareness of the positive effects of technology in the classroom is important for the general public to support technological initiatives in U.S. schools. Without public support, including that of the parent stakeholder group, the sustenance of these programs will be threatened as such programs are supported by local and national funding endorsed by tax payers. In this research study, Rogers (2003)

diffusions of innovations theory served as an integral lens to interpret the data and understand the different aspects of adoption of the one-to-one laptop program as an innovation. It was through the expressed relative advantage that the one-to-one laptop program provided to both the parents and their children that helped form their overwhelming approval of the program. Also, it was the technology coordinator at each school that served as a communication channel to parents and other stakeholders in order to provide an effective technology support system.

Understanding the perceptions of all stakeholders, including parents, and how educators can use technology as a cognitive tool, can create positive social change by providing successful educational outcomes and allow the field of education to move closer to a current and beneficial learning experience. If the past is a predictor of the future, the growing trend of jobs requiring advanced technology skills and knowledge will continue to increase. Programs such as one-to-one laptops will help students get ready for this inevitable reality as they enter post-secondary education and their future careers. Understanding the opinions and view of the parent stakeholder group has been shown in this study to be a vitally important component to one-to-one laptop programs in schools and further research of this stakeholder group is needed in order to fully understand these connections.

Conclusion

Research has shown that placing a digital device into the hands of every student in a single school can yield positive results, which includes improved educational outcomes and increased motivation toward learning (Harper & Milman, 2016; Zheng et al., 2016).

There still remain many issues associated with implementing one-to-one laptop programs, including access to resources, support, infrastructure, socioeconomic and cultural influence, self-efficacy, and student, teacher, and other-stakeholder buy-in (Crook, Sharma, & Wilson, 2015; Islam & Andersson, 2015; Pereira, 2016; Robinson, 2016; Tallvid et al., 2014). There have been many studies conducted exploring the benefits of technology use on students' motivation, attitudes, and learning outcomes, but no research has specifically explored how the parents of high school students feel about such technology use in an educational program, particularly a one-to-one laptop program (Léger & Freiman, 2016). My research study has not only started to fill an important gap in the research literature regarding educational technology, but it has also provided insights that can be used to make current technology initiatives better, or to advise ones that are just being developed.

Based on this study of a limited number of parents, it appears that parents are a force to be reckoned with; acknowledging their voices and knowing their opinions can positively inform technology programs in schools, or doom them to failure. It is clear from this study that parents are not asking for help or training so that they can better assist their children with the one-to-one devices that schools have already given them to use. Parents are ready and willing to give away their authority to schools so that they manage these digital devices and ensure that students are using them appropriately and for academic purposes. They need schools to not only help their children use these devices, but also to take on the full role of maintaining them, making sure that they are functional, and keeping them up to date.

Parents want to know that the one-to-one laptops are provided for academic purposes, unlike the smartphones that they have already put into their children's hands which cause much angst and frustration. This is due to unmoderated access to unfiltered content and non-stop entertainment that these smartphones provide. If schools were to provide training to parents, it probably should be in form of helping them regulate and manage the technology they, the parents, have already put into their children's hands, such as smartphones and other parent-provided digital devices such as tablets and laptops. Schools need to be ready to take on full responsibility of any device they provide to students. This suggests that districts, schools, and other educational organizations must create new policies or modify existing ones to provide effective technology program implementations.

In a Pew research study, Rainie (2018) suggested that the future of technology will bring a great shift toward mobile technologies similar to the smartphone and that the distinction between home and work will be blurred. Globally, we will be immersed in an ambient networked computing environment. Rainie fears that humans and their organizations may not respond quickly enough to challenges provided by complex networks. If schools and educational organizations do not seek to understand the smartphone and other mobile devices as educational tools, then they may not be fully preparing themselves for the future. Schools need to be prepared and ready for this inevitable future, and my study provides insights to help us during this educational technology transformation evolution in schools.

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Appendix A: Letter of Cooperation

Los Angeles Unified School District
Office of Data and Accountability
333 South Beaudry Avenue, 16th Floor, Los Angeles, California 90017
Telephone: (213) 241-2460 Fax: (213) 241-8462

Vivian Ekchian
Interim Superintendent of Schools

Oscar Lafarga
Executive Director

February 13, 2018

Mr. Lewis Chappelear
10401 Rubio Avenue
Granada Hills, CA 90290

Dear Researcher:

The LAUSD Committee for External Research Review has approved your request to initiate the research study entitled "Parent perceptions of a one-to-one laptop program." This action by the Committee is an approval to conduct your study in LAUSD schools according to the terms presented in the Statement of Agreement for External Researchers and signed on December 8, 2017. This letter does not:

- Create any obligation for district personnel, students, or parents to participate. All participation must be completely voluntary and the confidentiality of all sources must be maintained.

- Permit the administrators or staff to engage in this study during paid work time nor any students to engage in this study during instructional time.

The approval is valid for one year from the date of this letter. At the conclusion of your study or one year from today, whichever comes first, please send a practitioner-friendly summary (Power Point presentation, infographic, research brief, etc.) of your findings and copies of any reports to my attention. I wish you the best of luck in your research endeavors.

Sincerely,

Katherine Hayes, Ph.D.
Coordinator CERR, School Experience Survey
Research and Reporting Branch
Office of Data and Accountability
Los Angeles Unified School District
333 S. Beaudry Ave. 16th Floor
213-241-5153

Appendix B: Consent Form

You are a parent of a child using a school laptop in class and at home. I would like to talk with you and other parents to learn about how parents feel about this. This form is a process known as "informed consent" to provide you with information about the study in order to see if you would like to participate.

Lewis Chappelear, a doctoral student at Walden University, is conducting this study. You may already know him. He is also a teacher at James Monroe High School in the Los Angeles Unified School District. This study is not related to his role as a teacher at James Monroe High School.

Background Information:

The purpose of this study is to let you share your thoughts and experiences as a parent of a child being given a free laptop to use at both home and school. What you share may be positive, negative, or both. Lewis Chappelear, the researcher, would like to form an understanding of what you and the other participants share.

Procedures:

If you agree to be in this study, you will be asked to:

- Participate in one audio-recorded focus group with 6 to 8 other parents. This session will last no longer than one hour.
- If the researcher would like to talk to you after the focus group session, he may talk to you on a recorded phone call, through email, or in-person. This conversation will let the researcher ask you some questions to learn more about your experiences. These interviews will last no longer than one hour.

These are some sample questions that you may be asked during the focus group session:

- How to you feel about your child being given a laptop to use both at school and at home?
- What do you typically see your child doing on the computer at home?

Voluntary nature of the study:

This study is voluntary. No one at the school will know whether you decide to participate in this study or not. Even if you decide to sign this form and become a participant in this study, you may withdraw your intent to participate even during the interview process.

Benefits and risks of participating in the study:

All participants will be providing important information the researcher will use to understand how parents feel about their child being given a laptop to use both at home and at school.

Participation in this study will not risk your safety or wellbeing. You will be required to give your own personal time for the interviews as well as transportation to and from the

interview location. You may also experience some discomfort in sharing your personal views with others in the focus group. You will not be required to provide any more information than what you are comfortable with. You understand that the researcher, as a mandated reporter, is legally obligated to report any suspicion of illegal behavior such as sexual or physical abuse of any kind.

Payment:
You will receive a gift card in the amount of $20.00 for your participation in this study. Light refreshments will also be provided during the focus group session.

Privacy:
All information that you provide will remain confidential and private. The researcher will not use your name or contact information for any public purposes. Your information including your name will not be used in the study report. All information and data that you provide will be stored in a locked and private location. Data will be retained for a period of at least five (5) years, as required by the University. After this period, all data will be destroyed.

Contacts and Questions:
Please feel free to contact the researcher, Lewis Chappelear, at any time. He may be reached by telephone at 818-425-6221 or email at lewis.chappelear@waldenu.edu. If you would like to talk to a representative at Walden University with regard to your rights as a participant, you can call their Research Participant Advocate at 612-312-1210. Walden University's approval number for this study is: 12-08-17-0161608 and expires on December 7, 2018.

The researcher will give you a copy of this signed form to keep for your records.

Statement of Consent:
I have read the above information and understand the above study well enough to make a decision to participate. By signing below, I understand that I am agreeing to the terms described above.

_____
Printed Name of Participant

_____
Date of Consent

_____
Participant's Signature

_____
Researcher's Signature

Appendix C: Parent Recruitment Letter

Dear Parent,

As a parent of a child participating in a one-to-one take-home laptop program, you are invited to participate in a research study to understand your thoughts about the take-home laptop program, whether positive, negative, or both.

Lewis Chappelear, a doctoral student at Walden University, is conducting this study for his dissertation. You may already be familiar with the researcher, as he is also a staff member at James Monroe High School in the Los Angeles Unified School District, but this study is separate from that role.

If you agree to be in this study, you will be asked to:

- Participate in a minimum of one (1) audio-recorded focus group with approximately six to eight other parents at your child's school that will last no longer than one (1) hour.
- Speak with the researcher via recorded phone call, email, or in-person chat about your interview to address any follow-up questions.

Your participation in this study will be voluntary and your identity will be kept confidential. You will receive a gift card in the amount of $20.00 for your participation in this study.

if you are interested in participating
in this study, please contact:

Lewis Chappelear
XXX-XXX-XXXX
XXXXX@XXXX

If you prefer to leave your name for Mr. Chappelear to get in touch with you, please write your contact information below and return this form to the locked box in the main office:

Name: _____

Phone #: _____

Email: _____

Appendix D: Focus Group Questions

Research Question – Qualitative: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school?

I will begin the focus group with the following statement:

"Welcome and thank you for your participation in my study. My name is Lewis Chappelear and I am a graduate student at Walden University conducting my dissertation in partial fulfillment of the requirements for the degree of doctor of philosophy in education. Thank you for participating in this interview that is expected to take approximately 60 minutes. It will include six questions regarding your experiences as a parent of a child participating in a one-to-one take-home laptop program. By responding to these questions, you are giving me, the researcher, permission to include your information in my study. If, at any time, during this interview you wish to discontinue your participation, please let me know. Your identity will remain protected and I will use a pseudonym to refer to you in all study documents. I am the only person who will know your identity other than the others in this focus group. I ask that you please keep the identities and information provided by the other participants in this room confidential and private. The discussions that take place here will be used to develop an understanding of how you and other parents feel about your child being given a laptop to use both at school and at home. This information has the potential to promote positive social change in education and help us understand the impacts of providing personal digital technology to secondary students.

At this time, I would like to remind you of your written consent to participate in this study. I am the responsible investigator, supervising your participation in this research project. You and I have both signed and dated each copy, confirming that we agree to continue with this interview. You should have already received one copy and I will keep the other under lock and key, separate from your reported responses.

Your participation in this electronic interview is completely voluntary. If at any time you need to stop, take a break, or return to another question, please do so freely. If you have difficulties completing the interview, please let me know. You may also withdraw your participation at any time without consequence. Do you have any questions or concerns before we begin?

Semi-Structured Focus Group Guiding Questions/Prompts:

Research Question – Qualitative: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school?				
Focus Group Guiding Questions	Further Guiding Questions (If Needed)	Connections to the *diffusions of innovations* theory	Perception (Attitude, Belief, Opinion)	Initial Precodes
How do you think your	What are some software programs	Knowledge	Belief	Educational uses of laptop

child uses his or her laptop at school?	and Internet sites you think your child uses on the laptop at school? What are some non-school related ways your child uses the laptop at school?	Relative Advantage		Non-educational uses of laptop
What have you seen your child doing on the laptop at home?	What are some ways your child uses the laptop at home that are related to school? What are some ways your child uses the laptop at home that are not related to school?	Knowledge Relative Advantage	Belief	Educational uses of laptop Non-educational uses of laptop
What do you think about your child being given a laptop by the school to use both at school and at home?	What are some of the benefits of the laptop program and why do you think they are benefits? What are some of the harms of the laptop program and why do you think they are harms?	Relative Advantage	Opinion Attitude	Benefits Harms
Where do you go for help if you have any questions or need assistance regarding this issue?	How did you know to go to this person or resource for help? What did you learn from this person or other resource? How did this person or resource affect your attitude toward your child being given a laptop? Where can you go to find out more information?	Social System Communication Channels Social System Persuasion Knowledge Champions	Attitude Belief	Communication Channels (family, friends, school, community, church) Training needs Source of training Information being given to parents

	Where are some additional places that you know of that can help you learn more? What additional resources do you need?			
How has your opinion of the laptop program changed over time?	What has caused your opinion to change? Why did your opinion change? If someone from another school asked for your opinion about starting a one-to-one laptop program, what would you recommend and why?	Relative Advantage Decision Implementation Confirmation	Opinion Belief Attitude	Benefits Harms Training Needs Causes of positive opinion change Causes of negative opinion change Neutral Opinions
Do you have anything else that you would like to add to this conversation before we conclude with the discussion?	Would anyone else like to add something?			

Semi-Structured Follow-Up Interview Guiding Questions/Prompts:

Research Question – Qualitative: What are the perceptions of parents regarding the involvement of their high school-age children in a one-to-one laptop program in school?				
Follow-Up Interview Guiding Questions	Further Guiding Questions (If Needed)	Connections to the diffusions of innovations theory	Perception (Attitude, Belief, Opinion)	Initial Precodes
Do you think it is important that your child	How will the world your children will live and work in be	Relative Advantage Knowledge	Belief Opinion	Benefits Harms

develop technology knowledge and skills? Why or why not?	different from yours, in regard to use of technology?	Persuasion Social System	Attitude	
What do you do together on the computer at home with your child?	What would you like to do with your child on the computer? Please explain what it is like working with your child on the computer.	Relative Advantage Knowledge	Attitude Belief	Parent/Child Technology Interactions Educational Used of Laptop Non-Educational Used of Laptop Benefits Harms
What are some inappropriate ways you have seen your child using the laptop?	Does this effect the way you think about the laptop program? Do you monitor your child's use of the laptop? How? (If not, then what prevents you from doing so, or why do you choose not to monitor your child's use of the laptop? Does this have any impact on your opinion about the laptop program? Do you talk about this with anyone at home, in your community, or at school?	Relative Advantage Social System Persuasion	Opinion Attitude Belief	Training needs Harms Causes of positive opinion change Causes of negative opinion change Neutral Opinions Non-educational uses of laptop
Do you have anything else that you would				

like to add to this conversation before we conclude with the discussion?	

Appendix E: Transcriber Confidentiality Agreement

CLIENT NON-DISCLOSURE AGREEMENT

This CLIENT NON-DISCLOSURE AGREEMENT, effective as of the date last set forth below (this "Agreement"), between the undersigned actual or potential client ("Client") and **Rev.com, Inc.** ("Rev.com") is made to confirm the understanding and agreement of the parties hereto with respect to certain proprietary information being provided to Rev.com for the purpose of performing translation, transcription and other document related services (the "Rev.com Services"). In consideration for the mutual agreements contained herein and the other provisions of this Agreement, the parties hereto agree as follows:

1. Scope of Confidential Information

1.1. "Confidential Information" means, subject to the exceptions set forth in Section 1.2 hereof, any documents, video files or other related media or text supplied by Client to Rev.com for the purpose of performing the Rev.com Services.

1.2. Confidential Information does not include information that: (i) was available to Rev.com prior to disclosure of such information by Client and free of any confidentiality obligation in favor of Client known to Rev.com at the time of disclosure; (ii) is made available to Rev.com from a third party not known by Rev.com at the time of such availability to be subject to a confidentiality obligation in favor of Client; (iii) is made available to third parties by Client without restriction on the disclosure of such information; (iv) is or becomes available to the public other than as a result of disclosure by Rev.com prohibited by this Agreement; or (v) is developed independently by Rev.com or Rev.com's directors, officers, members, partners, employees, consultants, contractors, agents, representatives or affiliated entities (collectively, "Associated Persons").

2. Use and Disclosure of Confidential Information

2.1. Rev.com will keep secret and will not disclose to anyone any of the Confidential Information, other than furnishing the Confidential Information to Associated Persons; provided that such Associated Persons are bound by agreements respecting confidential information. Rev.com will not use any of the Confidential Information for any purpose other than performing the Rev.com Services on Client's behalf. Rev.com will use reasonable care and adequate measures to protect the security of the Confidential Information and to attempt to prevent any Confidential Information from being disclosed or otherwise made available to unauthorized persons or used in violation of the foregoing.

2.2. Notwithstanding anything to the contrary herein, Rev.com is free to make, and this Agreement does not restrict, disclosure of any Confidential Information in a judicial, legislative or administrative investigation or proceeding or to a government or other regulatory agency; provided that, if permitted by law, Rev.com provides to Client prior notice of the intended disclosure and permits Client to intervene therein to protect its interests in the Confidential Information, and cooperate and assist Client in seeking to obtain such protection.

3. Certain Rights and Limitations

3.1. All Confidential Information will remain the property of Client.

3.2. This Agreement imposes no obligations on either party to purchase, sell, license, transfer or otherwise transact in any products, services or technology.

4. Termination

4.1. Upon Client's written request, Rev.com agrees to use good faith efforts to return promptly to Client any Confidential Information that is in writing and in the possession of Rev.com and to certify the return or destruction of all Confidential Information; provided that Rev.com may retain a summary description of Confidential Information for archival purposes.

4.2. The rights and obligations of the parties hereto contained in Sections 2 (Use and Disclosure of Confidential Information) (subject to Section 2.1), 3 (Certain Rights and Limitations), 4 (Termination), and 5 (Miscellaneous) will survive the return of any tangible embodiments of Confidential Information and any termination of this Agreement.

5. Miscellaneous

5.1. Client and Rev.com are independent contractors and will so represent themselves in all regards. Nothing in this Agreement will be construed to make either party the agent or legal representative of the other or to make the parties partners or joint venturers, and neither party may bind the other in any way. This Agreement will be governed by and construed in accordance with the laws of the State of California governing such agreements, without regard to conflicts-of-law principles. The sole and exclusive jurisdiction and venue for any litigation arising out of this Agreement shall be an appropriate federal or state court located in the State of California, and the parties agree not to raise, and waive, any objections or defenses based upon venue or forum non

conveniens. This Agreement (together with any agreement for the Rev.com Services) contains the complete and exclusive agreement of the parties with respect to the subject matter hereof and supersedes all prior agreements and understandings with respect thereto, whether written or oral, express or implied. If any provision of this Agreement is held invalid, illegal or unenforceable by a court of competent jurisdiction, such will not affect any other provision of this Agreement, which will remain in full force and effect. No amendment or alteration of the terms of this Agreement will be effective unless made in writing and executed by both parties hereto. A failure or delay in exercising any right in respect to this Agreement will not be presumed to operate as a waiver, and a single or partial exercise of any right will not be presumed to preclude any subsequent or further exercise of that right or the exercise of any other right. Any modification or waiver of any provision of this Agreement will not be effective unless made in writing. Any such waiver will be effective only in the specific instance and for the purpose given.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed below by their duly authorized signatories.

CLIENT

Print Name: LEWIS CHAPPELEAR

By: _____
Name: LEWIS CHAPPELEAR
Title:
Date: 6-7-2018
Address for notices to Client:

10701 RUBIO AVE.
GRANADA HILLS, CA 91344

REV.COM, INC.

By: _____
Name: Cheryl Brown
Title: Account Manager
Date: June 4, 2018
Address for notices to Rev.com, Inc.:

222 Kearny St.
STE 800
San Francisco, CA 94108

Appendix F: District Acceptable Use Policy for Technology Use

This Acceptable Use Policy was adopted by the Board on April 25, 2006

The District's Acceptable Use Policy ("AUP") is to prevent unauthorized access and other unlawful activities by users online, prevent unauthorized disclosure of or access to sensitive information, and to comply with the Children's Internet Protection Act ("CIPA"). As used in this policy, "user" includes anyone using the computers, Internet, email, chat rooms and other forms of direct electronic communications or equipment provided by the District (the "network."). **Only current students or employees are authorized to use the network.**

The District will use technology protection measures to block or filter, to the extent practicable, access of visual depictions that are *obscene, pornographic, and harmful to minors* over the network. The District reserves the right to monitor users' online activities and to access, review, copy, and store or delete any electronic communication or files and disclose them to others as it deems necessary. Users should have no expectation of privacy regarding their use of District property, network and/or Internet access or files, including email.

Acceptable Uses of the LAUSD Computer Network or the Internet

Schools must verify each year students using the computer network and Internet access for that school year have a signed page acknowledging this policy. Students who are under 18 must have their parents or guardians sign this page and schools must keep it on file. Once signed that permission/acknowledgement page remains in effect until revoked by the parent, or the student loses the privilege of using the District's network due to violation of this policy or is no longer an LAUSD student. Employees and other users are required to follow this policy. Even without signature, all users must follow this policy and report any misuse of the network or Internet to a teacher, supervisor or other appropriate District personnel. Access is provided primarily for education and District business. Staff may use the Internet, for incidental personal use during duty-free time**. By using the network, users have agreed to this policy.** If a user is uncertain about whether a particular use is acceptable or appropriate, he or she should consult a teacher, supervisor, or other appropriate District personnel.

Unacceptable Uses of the Computer Network or Internet

These are examples of inappropriate activity on the District web site, but the District reserves the right to take immediate action regarding activities (1) that create security and/or safety issues for the District, students, employees, schools, network or computer resources, or (2) that expend District resources on content the District in its sole discretion determines lacks legitimate educational content/purpose, or (3) other activities as determined by District as inappropriate.

- **Violating any state or federal law or municipal ordinance, such as: Accessing or transmitting pornography of any kind, obscene depictions, harmful materials, materials that encourage others to violate the law, confidential information or copyrighted materials;**
- **Criminal activities that can be punished under law;**
- **Selling or purchasing illegal items or substances;**
- **Obtaining and/or using anonymous email sites; spamming; spreading viruses;**
- **Causing harm to others or damage to their property, such as:**

    1. Using profane, abusive, or impolite language; threatening, harassing, or making damaging or false statements about others or accessing, transmitting, or downloading offensive, harassing, or disparaging materials;
    2. Deleting, copying, modifying, or forging other users' names, emails, files, or data; disguising one's identity, impersonating other users, or sending anonymous email;

3. Damaging computer equipment, files, data or the network in any way, including intentionally accessing, transmitting or downloading computer viruses or other harmful files or programs, or disrupting any computer system performance;
4. Using any District computer to pursue "hacking," internal or external to the District, or attempting to access information protected by privacy laws; or
5. Accessing, transmitting or downloading large files, including "chain letters" or any type of "pyramid schemes".

- **Engaging in uses that jeopardize access or lead to unauthorized access into others' accounts or other computer networks, such as:**

1. Using another's account password(s) or identifier(s);
2. Interfering with other users' ability to access their account(s); or
3. Disclosing anyone's password to others or allowing them to use another's account(s).

- **Using the network or Internet for Commercial purposes:**

1. Using the Internet for personal financial gain;
2. Using the Internet for personal advertising, promotion, or financial gain; or
3. Conducting for-profit business activities and/or engaging in non-government related fundraising or public relations activities such as solicitation for religious purposes, lobbying for personal political purposes.

Student Internet Safety

1. Students under the age of eighteen should only access LAUSDnet accounts outside of school if a parent or legal guardian supervises their usage at all times. The student's parent or guardian is responsible for monitoring the minor's use;
2. Students shall not reveal on the Internet personal information about themselves or other persons. For example, students should not reveal their name, home address, telephone number, or display photographs of themselves or others;
3. Students shall not meet in person anyone they have met only on the Internet; and
4. Students must abide by all laws, this Acceptable Use Policy and all District security policies.

Penalties for Improper Use

The use of a District account is a privilege, not a right, and misuse will result in the restriction or cancellation of the account. Misuse may also lead to disciplinary and/or legal action for both students and employees, including suspension, expulsion, dismissal from District employment, or criminal prosecution by government authorities. The District will attempt to tailor any disciplinary action to the specific issues related to each violation.

Disclaimer

The District makes no guarantees about the quality of the services provided and is not responsible for any claims, losses, damages, costs, or other obligations arising from use of the network or accounts. Any additional charges a user accrues due to the use of the District's network are to be borne by the user. The District also denies any responsibility for the accuracy or quality of the information obtained through user access. Any statement, accessible on the computer network or the Internet, is understood to be the author's individual point of view and not that of the District, its affiliates, or employees.

I have read, understand, and agree to abide by the provisions of the Acceptable Use Policy of the Los Angeles Unified School District.

Date: _____ School: _____

Student Name: _____ Student Signature: _____

Parent/Legal _____ Parent/Legal _____

Guardian Name: _____ Guardian Signature: _____

Please return this form to the school where it will be kept on file. It is required for all students that will be using a computer network and/or Internet access.

Appendix G: Codes, Categories, and Themes

List of Codes, Explanations, and Examples

Code	Explanation	Examples
Affirmation of Acceptance (AA)	Confirmation of positive attitude toward one-to-one laptop program.	"I've always loved the laptop. I love, love, love that they have computers." (Beth) "I love that they have access to technology and that they have the ability to use it." (Bella) "…no, I've never had a problem with it to be honest." (Jonny)
Benefit (B)	Statements that give examples of how the one-to-one laptop program is beneficial.	"It seems that the more you know how to use the laptop, the quicker and faster they are in learning." (Ben) "The students can now take a picture of a page in a book and now don't have to take the book home. This is a great thing because the books are so heavy." (Bill) "My kids have Apple laptops at home. Getting a PC is allowing them to learn how to use both." (Jessie)
Causes of Negative Opinion Change (NO)	Statements that indicate what contributes toward a negative opinion.	"My son is so addicted to using his laptop, phone, videogame device, etc. I have seen this with his classmates and friends, but it's just especially with the boys." (Julie) "Well, what I think is not because I'm from Africa. Maybe a little bit of influence is from that, but I have no problem with them using laptops in school. I just don't want my son bringing it home. I don't want to be responsible for it in case he loses or breaks it." (Julia)
Causes of Positive Opinion Change (PO)	Statements that indicate what contributes toward a positive opinion.	"My son, he wasn't doing so well in school, so I decided to observe his classes. My head was spinning because every single class he was in, he needed a laptop." (Bella) "My opinion definitely changed when I found out that I could now have my own laptop, the one I shared with my daughter – I don't need to share at home now because school gave her a good one." (Bill)
Educational Use of Laptop (ED)	Ways that parents think their children use their laptop for school.	"My son is a Junior and he just uses his laptop for his school work." (Beth) "He uses his laptop for research and doing his homework – he goes on to Khan Academy, you name it." (Bill) "The students actually read on the computer – so quick and fast. They even use it for math. They were doing math on the computer." (Bella) "They use Google Classroom a lot." (Beth)

		"He a ninth grader and uses the laptop for assignments, PowerPoint, write essays, take online tests and homework. Since it's online it's graded right there." (Jessie)
		"…his whole math textbook, he's using it online." (Julia)
		"My son is using a program called Duolingo in his Spanish class. He can also use this program on his phone." (Jonny)
Fears in the Beginning (FB)	Feelings that parents felt when their child was given a laptop by the school.	"My first concern was, uh I was afraid, in the beginning. Because my daughter, with the cell phone, went over the limit and was watching stuff that we don't like. I thought it may get stolen and we would be charged for it." (Bill)
Harm and Concerns (H)	Statements that indicate a parent's feelings of concern for how the laptop may be distracting and/or harmful.	"My daughter is very smart, but it's the focus. You know, sometimes gets diverted. That's why we have to be on her, about her phone or whatever she's watching on the laptop." (Bill)
		"The kids can probably break some of the filters and, and go around on you know, in the laptop." Bill
		"…and the fact that she's maybe seeing something wrong or what have you." (Bill)
		"I don't really see anything negative at all." (Beth)
		"There's always going to be a heightened risk when we give them access to technology. It's the same as when they start driving – they have more access. You have more access, there's higher risk." (Jill)
		"I feel like he doesn't get enough sleep, and I think next year being a Junior, I don't really think he realizes it's going to be very challenging for him." (Jonny)
Monitor Laptop Usage (M)	How parents check and what their child is doing on the laptop and what they feel about it.	"When I'm doing my best work, I like to listen to music. I understand it when my child likes to listen to music while working." (Jill)
		"I've taken off the wi-fi many times. There are still games on the computer itself." (Julia)
		"Why do they have their laptop after 10:00, 11:00? It needs to be shut off and shut down because we grew up in a generation making sure the phone didn't ring under covers, you know, after 10:30." (Jill)
		"The only thing I have over my son is getting his driver's license." (Jonny)

New Ways to Learn (N)	What parents see their children doing on their laptops both at school and at home that indicate ways of learning that are not possible without the laptop or other technologies.	'Even for math, they were doing math on the laptop in class." (Bella) "What the kids do on their laptops at a much higher level depends on how tech savvy the teachers are." (Jill) "Some teachers are posting video of themselves explaining the assignment." (Jill) "The kids are already tech savvy. It's really sort of changing the way teachers provide content and interact with the kids." (Jessie) "My daughter told me that she's watching this Colombian tele-novela because she wants to hear the Spanish, and that's good." (Bill) "Right. There are so many wonderful things that you can learn on YouTube." (Beth) "They take a picture of it and they bring it home, so they don't have to bring the whole book." (Bill) "The thing is too, watching shows, it doesn't matter what the show is, whether it's supposed to be educational or not, you're gonna learn something." (Beth)
Non-Educational Use of Laptop (NED)	What parents see their children doing on their laptop that is not related to school work.	"Yeah, my son too, Netflix." (Berta) "YouTube, YouTube. Way more than Netflix." (Beth) "She does her own braids because she's learning that on YouTube." (Bill) "When she's not working, she's on there looking at fashion." (Jill) "He uses it with his friends to play videogames." (Julie) "Netflix, I see a lot of that. He tells me that kids are watching Netflix at nutrition and lunch almost all the time." (Julie) "Even if there's a firewall the kids are always going to get through." (Jane) "He doesn't want to do any kinds of chores without having the music on. Spotify." (Julia) "Okay, you want to use the laptop for pleasure, that's fine, I use it for pleasure too, but get the work done first." (Julia) "Videogames, yeah." (Julia)

Smartphone (SP)	Parents' responses that are about smartphones and not the one-to-one laptop program.	"Music and social media. It's fast on the smartphones so they're not using the computers for that stuff." (Beth) "They just wanna play on their smartphones." (Beth) "He likes to play the little games that they get on the phone." (Bella) "He plays videogames on the phone." (Ben) "The smartphones don't have any filters." (Bill) "My son is so addicted to his phone." (Jane)
Training/Assistance /Support (TAS)	Support systems for parents and/or their children to get help with the use of technology and/or use of the laptops.	"I think the biggest need I have is to have a laptop like his. To be able to learn more with regard to what they're learning in school." (Bella) "I'm blessed because my son is in a technology program and they help him in ways that I can't – I just know how to go on the Internet – that's about all." (Jonny) "My son is in a mentoring program and they help him and they help me too." (Julia)

List of Categories, Explanations, and Examples

Category	Explanation	Examples
Affordances	What the laptop program provides, either for good or bad	"Laptop gives my daughter the ability to take charge of everything in her life." (Jill) "The laptop has created a level of independence that my daughter would not have had." (Jill) "I noticed that the laptop definitely helped with grades." (Beth) "We only have one c for my daughter." (Bill) "It's much easier on the teacher and much easier on the students." (Bella) "It helps with homework – a lot!" (Berta) "The laptop makes everything more efficient for my son. When I was his age, I had to rip up the paper and start over if I made a mistake. The laptop just makes the process more efficient and quicker" (Beth) "My son is addicted to using technology. Whether it's his phone, his laptop, his gaming device, or whatever. I see the other boys addicted to all of it also." (Julie)

		"The laptop has definitely, um…for her created a level of independence that she would not have had." (Jill)
		"Now my kids are not going on my computer giving it viruses. I like it that the school has someone that helps with my kids' laptop as well has all of the filters and restrictions." (Jill)
		"Some teachers us Schoology so the kids can check their grades, submit their work, and see how they're doing. Unfortunately, not all of the teachers use Schoology." (Beth)
		"I usually see my son using MS Word – he uses it a lot. He also uses Google to do research and one of his teachers uses Photoshop with the kids." (Beth)
		"All of them us YouTube. Way more than Netflix. There are so many wonderful things that you can learn on YouTube, but there are also so many other things that you shouldn't be seeing." (Beth)
		"I think the YouTube on the kids' computers is the educational version, but I'm not sure." (Bill)
		"He uses his laptop for PowerPoints, Word presentations, or anything that he had to look up in the Internet for his classroom." (Jane)
		"He only uses his laptop when he needs to study. When he's not studying he doesn't use it." (Jane)
		"I have two kids at this school with laptops. They have the school laptop and they have their own laptop at home. So, I would say that they use the school one for school assignments. One uses it for math – the math assignments are computer-based. They can also take notes on the laptop. I don't think they use the school laptop for much otherwise." (Jessie)
		"My daughter uses her laptop for everything. She uses it for all of her assignments, researching on the Internet…as opposed to actually having to find a thesaurus or encyclopedia. We also have a free hotspot that the school gave us." (Jill)
		I have to watch him always with, like he would sneak out of bed in the middle of the night to go pay games on his laptop." (Beth)
		"He would leave his laptop in the locker and next thing you know, his laptop was missing." (Bella)
Monitoring	How do parents monitor laptop use	"Get the work done first before you use the laptop for pleasure." (Julia)
		"…we stop by when she's doing work, when she has the laptop open, to see what she's viewing to make sure she's watching

		something related to school. You can see the tabs are open, how many tabs there are. The most she's done is watch Netflix." (Bill) "But the parents are the same. You know she's very smart, but it's the focus." (Bill) "Because I know my son's password, I know everything. He knows me that I'm gonna go in and snoop around." (Bella)
Smartphone	References to the parent's statements regarding smartphones	"They shouldn't be on the phone." (Bill) "But you know, the phone is a big problem." (Ben) "I find that the kids are not as savvy today as they were three years ago, it's like flip-flopping because everything is so convenient on the phone. The smartphones are easy, the computers they use for their school." (Beth) "They check their assignments on their phone." (Jessie) "It's like when an email comes in we want to just pick it up on our phone." (Jill) "I think he's on his phone probably more." (Jonny)
Support	Where parents and their children go for support	"They give classes at the Boys and Girls Club. I remember going to one of them. They taught just the basics." (Bill) "One of the best workshops is the social media awareness workshop." (Jill) "The teachers, when he was in middle school, they all asked him. He was like the techy person. It's good and bad. It's bad because he feels like he's up here on us." (Jonny) "Not every parent has figured out how to use Passport, but if you're on it, it's very useful. I can check attendance on there." (Jessie)

List of Themes, Explanations, and Examples

Category	Explanation	Examples
It's Not the Laptop!	Distractions and Problems? Devices other than laptops that may cause more problems and/or distractions.	"I think we should be more worried about what they actually have access to on their smartphones." (Bill) "My daughter, she's more able to get distracted by things happening on her phone than on the laptop." (Bill) "Take away the smartphones. There's an addiction issue." (Julie)

Go see Billy!	Need help and support? Go see Billy (the Tech Support Person – that can be anyone who can help the child or the parent)	"The kids hear the announcements every day to take their computers to Billy the computer tech to get them looked at or taken care of." (Beth) "It's hard to get parents to come in for workshops on technology. We may get four parents." (Beth) "My son's in a mentoring program where there are other adults there. You see, that maybe it's my African mindset. There are other adults that will advise." (Julia) "Where can I go for help? Not in the school. No workshops or anything." (Ben) "We have a tech at school that's paid to train the students on how to use it. For the parents, the training is not on how to use the laptops, per se. The training is how to use Passport, how to navigate through the different portals." (Jill)
The Laptop as a Basic Human Right.	Just like books and paper; and food and water, the Laptop can be thought of as a basic human right in a school environment. Provides a relative advantage.	"My opinion hasn't changed much at all. From the beginning, the laptop has been a valuable thing for my daughter to have at home, school, to do research, and to do everything else." (Bill) "This laptop program is great because it gives computers to kids who wouldn't otherwise have one – it evens out the playing field." (Jessie) "The world is more computerized with computers everywhere. Having my child using a laptop in school is a good thing for him to learn how to use it at school." (Jane) "Offering a laptop to a family who has never had one before has the ability to start changing their culture and how they do things." (Jill) "When we were touring possible schools, I noticed that all of the private schools had one-to-one laptops. Choosing to come here, a public school, would have been much more difficult if you didn't offer a laptop for my child." (Jonny) "We are getting our students ready for college because they will need to know how to use a laptop and other technologies in order to be successful here. I don't know how other students are going to prepared this much without this laptop program." (Jessie) "When I found out that my daughter was going to get a laptop as a freshman I thought to myself what a great idea that is and it will be one less expense. Laptops should be the normal now!" (Bill) "Most jobs require you to use a computer, regardless of where you work at. It's important that our kids have the ability to use technology in a professional way so that they can get further in life." (Bill)

		"I'm afraid of computers, but being out in the work world and not knowing how to use it – where our kids gonna be?" (Jessie) "My son uses his phone in Spanish class to do his assignment, which is on a website called Duolingo. He says that he's learned more on that website than he did like in the last three months of school." (Jonny) "Because this is a test, if they start to get teachers and students use to having this technology, then they decide to take them away because they (the District) can't afford it and decide to not do it anymore. If they put the kids on the road they need to stay on the road." (Jessie)
"We're barely learning how to swim and they're swimming already."	How parents compare their own knowledge of and experience using technology compared to their children.	The District is doing a good thing giving our kids laptops because we didn't have them when we were little. We didn't learn that way. Now we've barely learned how to swim and they are swimming already. They're on the top of the mountain." (Bella) "I was afraid because he's more advanced, in technology, than myself. I would prefer he use the desktop because I can watch it better. When I would check the desktop, I would see him be super quick to delete stuff that I know he doesn't want me to see. I like the desktop at home because I can check what he's really doing." (Berta) "I'm African, so, you know, you don't give rules to the elders. Teachers should not let their students listen to music through headphones in class." (Julia) "Well, you know, I grew up as a TV kid and understand how music and television can be a distraction or as a helpful tool." (Julie)