Summer 6-21-2019

Eighth-Grade Students Without Home Internet: A Case Study of a One-to-One Laptop Program at a Title 1 School

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Dissertation submitted to the Faculty of the College of Education

In partial fulfillment of the requirements for the degree of

Doctor of Education in

Educational Leadership

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Concordia University–Portland

2019

Abstract

To bridge the digital divide, school districts across the nation are adapting one-to-one Information and Communication Technologies (ICT) for their students. Each student in the program receives a laptop, Chromebook, or tablet for them to do digital assignments at school as well as at home. While the ICT digital divide was significantly reduced with one-to-one programs, another divide emerged from students who did not have access to the internet at home. The purpose of this qualitative study was to find out how students who did not have internet access at home felt about being a one-to-one ICT program. The researcher used Lave and Wenger's (1991) situated learning theory as the theoretical framework to support the data, student narratives, and findings in the study. The sample in the study were 15 one-to-one middle school students who did not have internet access at home from a Title I school in Texas. The researcher's qualitative methods to collect data included a questionnaire, individual interviews, as well as three focus groups. The results of this study indicate that students in the sample had difficulty conducting research, collaborating in group work, and trouble with completing digital homework assignments. The researcher also shared recommendations to improve the one-to-one ICT programs and policies to serve all students.

Keywords: digital divide, information, and communication technologies, one-to-one, instructional technology

Dedication

This dissertation is dedicated to the memory to my grandmother Hortencia Corona Woodard. She was my biggest cheerleader who always encouraged me to pursue my educational goals. Her dream lives through me. I love and miss you, Grandma.

Acknowledgments

First and foremost, thank you to our Heavenly Father, for whom none of this would be possible. I give Him all the glory and honor as I finish this journey.

I want to thank the students and administrators in the district who participated and helped me in this study. A special thank you to my team who have been there through every step of the way. Your love and support are appreciated more than you will ever know.

To my parents, who always knew that I was called to teach. Thank you for always supporting my educational goals. Mom introduced me to literacy at a very young age and likes to brag that I taught myself to read and write at the age of three. “And just think, it all started with a Fisher Price School Days Desk.” My dad went back to school while I was in high school and would sit and do homework with me. Dad, I saw you struggle, but I never saw you quit. Thank you for being that example to me. To my stepdad, Sam, thank you for always having my back.

To my husband Clint who had to endure all my craziness throughout this journey. Thank you for ‘talking me down’ and for believing in me when I did not believe in myself. To Christi, I really could not have done this without you. You have been my biggest cheerleader and supporter. The words *thank you* are not enough to show my appreciation. To Jen and Christine, my partners in crime. You two helped me keep my sanity in check, and you know how hard that is! I love you both! To Jerry C. (RIP), thank you for making me a better teacher.

Finally, to my fantastic faculty chair, Dr. Donna Graham, whose encouragement, support, and a great sense of humor got me through this very tedious process. You are a superhero; you should really wear a cape.

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Chapter 1: Introduction

Introduction

Public education has embraced instructional technology in the last few decades in order to prepare students for college and future careers. Many are using 21st century learning skills and STEM learning methods, particularly with the inclusion of information and communication technologies (ICT) in schools (The Partnership for 21st century learning, 2013). As these ICT technologies merge with pre-K–12 curriculum, some districts have taken instructional technology usage further by providing each student with a portable wireless device, usually a laptop or a tablet. This process is known as one-to-one Information and Communication Technology (ICT) programs. ICT allows students who do not have computers at home the ability to have daily access at school and home. School districts throughout the country embraced one-to-one ICTs to help close the digital divide between low-income, minority students, and their counterparts (Zilka, 2016).

As schools introduced the one-to-one ICT programs into schools, the digital divide initially appeared to shrink considerably. However, another problem presented itself (Vigdor et al., 2014). Many districts found themselves giving one-to-one wireless devices to students with the assumption that they had regular wireless or broadband internet at home (Zhang et al., 2015). Districts are reevaluating these one-to-one ICT programs to accommodate students who do not have home internet access.

Background, Context, History, and Conceptual Framework for the Problem

According to The Partnership for 21st century learning (2013), 21st century learning methods encourage learning to focus on the 4C's: critical thinking, communication, collaboration, and creativity. Kivunja (2015) stated that graduates lacked vital skills in learning

and innovation, career and life skills, and digital literacy skills. These skills have been determined instrumental for students in order to work in future careers (Kivunja, 2015). Without 21st century learning skills, American students would not be qualified for or trained to fill these future high-demand jobs (Siu et al., 2014).

Since President Barack Obama's 2011 State of the Union address, many public, private, and charter school administrators have developed curriculum to emphasize Science, Technology, Engineering, and Mathematics (STEM) programs. "STEM project-based learning (PBL) is a current instructional strategy that is student-driven, interdisciplinary, collaborative, and technology-based" (Han et al., 2015, p 2). The emphasis on STEM was developed to meet the 21st century post-secondary educational and vocational requirements needed for future careers in STEM fields (Han et al., 2015).

Another issue with the curriculum standards, such as No Child Left Behind (NCLB), is the emphasis on state-mandated standardized testing to measure student achievement. In 2001, the U.S. Congress enacted the No Child Left Behind Act (NCLB), where schools were held to test-based accountability to determine student achievement (U.S. Department of Education, n.d.). This act forced states and school districts to revise their curriculum standards in order to prepare students to pass state assessments (Deming et al., 2016).

While the intention behind NCLB was good, one of the setbacks was the change from teaching the curriculum to "teaching the test," especially in large urban districts where they appeared to have the most to lose if their students did not do well on these tests (Reback, Rockoff, & Schwartz, 2014). The emphasis on these standardized tests to regulate school and student achievement did not benefit students as far as taking charge of their learning (Deming et al., 2016). The emphasis on standardized testing may have led schools to adopt strategies that

may have produced harm to student learning (Deming et al., 2016). For example, in Texas, some schools have categorized students who generally would not qualify for special education. This distinction exempted these students from taking these tests, which, in turn, may have caused them to harm educationally (Deming et al., 2016).

In 2010, the Elementary and Secondary Education Act (ESEA) was enacted to make modifications to NCLB (U.S. Department of Education, n.d.). This act lessened the penalties on failing schools, focused more on student achievement, and encouraged an emphasis on students using critical thinking skills, conducting research, problem-solving, and communications (U.S. Department of Education, n.d.). One of the revisions was the emphasis on technological improvements to school infrastructures as well as an emphasis on technology education. This act incorporated the need for more instructional technology and infrastructure to support it, and therefore emphasized 21st century skills into public school curricula (U.S. Department of Education, n.d.).

In 2015, Every Student Succeeds Act (ESSA) was signed by Obama in order to give states more flexibility in setting their standards to measure school and student achievement. Although this act replaced NCLB, it also continued to emphasize standardized testing as an indicator of school and student success (U.S. Department of Education, n.d.). In March 2018, the U.S. Congress issued the Congressional Review Act to eliminate the accountability regulations in ESSA. Even with the accountability regulations absent, state mandated-standardized testing continues to be used to measure student achievement, particularly measuring increases and decreases in student learning within the core subjects, but at the same time negating the STEM and 21st century modalities which are not measured on these standardized tests. Technology and pedagogy can no longer be treated as two separate entities; instead, they are intertwined and

imperative for the education of all students (Voogt et al., 2013). Therefore, to prepare students for future STEM careers, states should reconsider their view on standardized testing as the primary assessment of student learning and achievement.

The theoretical framework for this study is founded on situated learning theory from Lave and Wenger (1991) which is directly related to the 21st century learning methods used in many STEM programs throughout the country (Han et al., 2015). The three components in situated learning that include legitimate peripheral participation, the knowledge presented in authentic contexts, and community of practice (Lave & Wenger, 1991). These three components allow students to partake in their own learning experience using the 4C's of 21st century learning: critical thinking, communication, collaboration, and creativity (Rogers, 2016). The ICTs used in the classroom not only help students with the 4C's of 21st century learning in their formal education, but also helps them in their practical everyday lives, including job skills, research skills, and socialization. (Kong et al., 2014).

The empirical research for this study indicates that there are not many studies that focus on the lack of internet access and the effects on student achievement and homework completion. There is much research on the digital divide as it pertains to students who do not have ICTs in their homes (Rogers, 2016). Most of that research has to do with the lack of hardware, and few have addressed the lack of home internet access for students in urban areas (Vigdor et al., 2014).

Statement of the Problem

While one-to-one laptop programs are becoming more popular throughout the country, there has been little research on the impact of these programs. The digital divide is still present among many low Socio-Economic Status (SES), minority, and English Language Learner (ELL) students who may not be able to participate in these progressive programs because of lack of

home internet access (Rogers, 2016; Vigdor et al., 2014). The problem this study will explore is how do eighth-grade students without home internet access perceive the use of a one-to-one laptop program, in a Title I middle school in Texas. With the implementation of one-to-one technologies in many urban school districts, each student has regular access to ICT. However, the same students may not have regular internet access at home to complete their assignments required by their teachers.

Purpose of the Study

The purpose of the study is to explore how eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas. The researcher wanted to know if not having internet access hinders student achievement for those students in a one-to-one ICT program. The researcher hopes the findings of the study helps to improve all one-to-one ICT programs throughout school districts across the country.

Research Question

The research question was developed by reviewing the literature on the use of instructional technology in schools and its effect on learning. The research question that guided this study:

> How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

The research question focuses on examining details on the new use of instructional technology within the confines of a program of choice within a Title I middle school. Specifically, the researcher wants to know if one-to-one laptop students who do not have regular home internet access are at a disadvantage over their classmates who do have regular internet access at home. The researcher also wants to discover how those students feel about the challenges of not having home internet access for educational purposes.

Relevance, Rationale, and Significance of the Study

Relevance. This study is relevant to the area of pre-K–12 pedagogy because it hopes to provide new knowledge and data regarding the use of technology in the form of laptop programs for students who do not have regular internet access at home. This study will provide information to determine how Title I students in a one-to-one laptop program feel about not having internet access at home, and the challenges the lack of internet poses on their studies. Students in Title I schools often have less access to technology and therefore, may not have the same computer skills as their counterparts (Osborne & Morgan, 2016). The study will help educators to benefit from a better understanding of how to better serve the digital education needs of all students, and particularly of students who may not have regular home internet access.

Rationale. The importance of technology in everyday life had become even more significant now than in the 1990s when ICTs became present in many homes in the United States. (Patrikakou, 2016). No longer are ICTs used for entertainment purposes, but they have also become an essential part of educational and professional goals. With the addition of 21st century learning skills, technology has become an intricate part of closing any achievement gaps. (Rogers, 2016).

Since this study is about middle school students in a Title I school who do not have internet access at home, digital learning is imperative considering the students are using the ICTs at school, but also at home without their teachers to help them. The blending of the informal and formal technology teaching to all students is essential in order to help close the digital gap (Kong et al., 2014). In other words, incorporating the situated learning theory framework to narrow the digital divide.

Although many school districts have ICT use in their classrooms, much of the focus of curriculum and instruction emphasizes passing the state-mandated assessments (Deming et al., 2016). The focus on standardized testing has created curriculum narrowing, in which teachers only focus their curriculum on "teaching the test" (Deming et al., 2016). Standardized testing emphasis has dramatically affected technology education courses, such as keyboarding.

The lack of technology education courses leads teachers to have to teach necessary ICT skills within their limited instructional time (Voogt et al., 2013). If teaching instructional technology was a priority as teaching students how to pass a standardized test, the digital learning gap would significantly close. (Voogt et al., 2013). Therefore, the emphasis on both standardized testing and 21st century learning appear to be counterproductive in attempts to reduce the digital divide.

The empirical studies in the literature indicate a need for additional research on how one-to-one ICT effects student achievement overall (Kong et al., 2014; Patrikakou, 2016; Rivers, 2017; Vigdor et al., 2014; Walsh et al., 2014). Other studies have concluded that research should specifically focus on student achievement among students in low SES, English Language Learners (ELL), and minorities, who statistically, may less likely have personal ICTs in their homes (Vigdor et al., 2014).

Significance. Students who use technology to complement their studies are more likely to master the 4C's of 21st century learning and therefore will be more prepared for those jobs that these skills are needed for in the future (Kong et al., 2014). Lave and Wenger's theory of situated learning is the framework that supports the premise as to why a one-to-one ICT environment is ideal for students. The situated learning theory promotes learning and practicing skills related to factual and realistic circumstances, and the one-to-one ICT programs support this

(Gaffney & Kercsmar, 2016) by giving the tools needed outside of the classroom and adapting it into their homes. Allowing students to use ICTs in order to gain 21st century learning skills allows students to not only master these skills but to take charge of their learning (Siu et al., 2014). Therefore, students who use ICTs as they are learning are more likely to retain the content in their lesson when assessed using the same ICT (Fan-Ray & Hwang, 2014).

There is evidence of a digital divide among schoolchildren related to their use of computers and the internet (Fan-Ray & Hwang, 2014); however, there have not been many studies on students in a one-to-one learning environment for those who do not have the internet at home. Title I schools where 40% or more of students qualify for free or reduced lunch, often have less regular home internet access and therefore may not have adequate resources to complete projects, collaborate with other students, or to complete homework assignments (Rogers, 2016).

Even with an increase of public and charter schools with one-to-one ICT programs, low SES, minority, and ELL students are less likely to have regular home internet (Zhang et al., 2015). Research indicates that providing all students with access to ICTs allows for an increase in access to learning opportunities and equitable resources (Zhang et al., 2015). Students at high SES schools, therefore, have a distinct advantage over students at low SES schools in completing assignments, and therefore have higher academic achievement since they are more than likely to have had ICT and internet access in their homes (Hatlevik, Guomundsdottir, & Loi, 2015).

Finally, this research study will help educators understand the students who may not have internet access at home. The focus of this study is to inform educators that equal technology access at school does not always equal technology access at home. The 21st century learning skills that many school districts are promoting in school may not be relevant at home if students

do not have internet access daily at home. Although students are given a wireless device in a one-to-one ICT program, without every student having regular internet access at home, there is still a digital divide among students. With this digital divide among students at home, there will still be an achievement gap among students, and therefore, educational opportunities are not equal among all students, even among students within the same school.

Definition of Terms

Digital divide. Bancroft (2016) describes the digital divide as members of underserved populations lacking enough experience and instruction in digital environments. The group includes people who do not have access to computers, smartphones, tablets, or other internet-abled electronic devices. People in this group also includes those who do not have regular internet access.

Information communications technologies (ICT). This term is used to describe software, hardware, internet-based programs, telecommunications, computer applications, course management software, and new technologies as they emerge (García-Valcárcel, Basilotta, & López, 2014).

One-to-One laptop program. A one-to-one laptop program is a learning environment that provides each student with a mobile technology device such as a laptop computer to be used in class and for homework assignments (Gagne, 2013).

Science, technology, engineering, and mathematics (STEM). STEM is a curriculum based on the combination of the four disciplines to fill future jobs in those fields (Department of Education, n.d.).

Title I school. A government designation where a school has 40% or more students who qualify for free or reduced lunch (Department of Education, n.d.).

21st century learning Skills. The Partnership for 21st century learning (2013) defines 21st century learning Skills as advanced skills that students need to engage the rapidly changing technological world around them. These skills include life and career skills, learning, and innovation skills (critical thinking, communication, collaboration, and creativity), technology skills, and knowledge in the core subjects of reading, writing, and math.

Assumptions, Limitations, and Delimitations

Assumptions. In order to conduct the study, there are several assumptions made in order to validate the findings of the study. Teachers in the Trailblazer Academy, a pseudonym, use specialized online textbooks and software in order to do their lessons, so the expectation is that all students bring their laptops daily. Behaviors, attitudes, expectations, or hopes fundamental to the validity of the study, e.g., high school teachers are implementing the sense of belonging strategies to all students.

1. All students participated in an ICT laptop program.
2. All students in the study will be in the Trailblazer Academy for the 2018–19 school year.
3. Student questionnaires, interviews, accurately reflected the thoughts and feelings of the students in the study.
4. Since the district, school, and students are anonymous in this study; it is also assumed that students never misrepresented their stance on being a one-to-one student without home internet access.
5. Digital native students are knowledgeable in digital educational skills, when, in fact, many schools do not mandate technology courses.

Limitations and delimitations. Limitations occur due to influences that are out of the control of the researcher. They represent potential shortcomings, influences, or other conditions that put restrictions on the methodology and conclusion of the research. On the other hand, delimitations are within the control of the researcher. They represent choices made by the researcher to set boundaries for the research. The following limitations/delimitations were present in this study.

Limitations. With any qualitative study, there are limitations where things may not go as planned. Deliberate or non-deliberate factors can impact the validity of results. The researcher has identified some of the limitations of this study in order to lessen the chances of inaccuracy in the study, therefore increasing the likelihood of getting the most accurate and credible results.

1. Student questionnaires, interviews, to evaluate home internet access were used for qualitative analysis for this study.
2. The results may not reflect the actual usage of computers by students due to intentional or unintentional falsification.
3. It was also limited by the number of participants, including only those students who responded to only the questionnaire.
4. The daily duration of time students used laptops at home for school use could not be determined.

Delimitations. This study focuses on how eighth-grade students perceive the use of a one-to-one laptop program, in a middle school in Texas without regular home internet access. Therefore, delimited to one middle school within a specific district, not incorporating other schools or grade levels.

1. It does not measure how laptop programs are used to determine if other factors (i.e., absenteeism, illness) influence student achievement.
2. It also did not attempt to measure student engagement in learning 21st century learning skills.
3. Student input is solely used to determine the results of this study.

Chapter 1 Summary

The primary focus of this study was to find out how students in a one-to-one ICT program felt about not having the internet at home and how they felt it affected their learning. The results of this research obtained a better understanding of the needs of students who may not have regular internet access at home and how that affected their grades and overall academic achievement. This research study can inform policy and practice within school districts that have one-to-one ICT programs within their schools. The primary interest of this study was to gain an understanding of the needs of SES, ethnic, and ELL students in such one-to-one programs in a Title I middle school.

Chapter 2: Literature Review

Introduction

The literature review research focuses on instructional technology, the digital divide, and frameworks that support the findings of this study. In order to address the research problem, a variety of theoretical considerations were needed for the study. Critical phrases used in the research were the digital divide, instructional technology, one-to-one information and communication technologies (ICTs), home internet access, 21st century learning, computers in the classroom, pre-K–12 pedagogy, homework, situated learning, constructivism, and connectivism.

The researcher conducted inquiries using the educational databases through the Concordia University library site such as SAGE, ProQuest, and JSTOR, and the Armadillo ISD (a pseudonym for the district for the school in the study) libraries site, as well as the Google Scholar research search engine. This chapter will examine the background of the problem with one-to-one programs without 100% home internet access participation, a brief history of the use of instructional technology in the classroom, and the evolution to what instructional technology is today. This literature review will also show the connection between the theoretical framework and the research to support this study.

The research for the digital divide is in two parts, the first being the initial ICT digital divide haves and have-nots; which then lends itself to the secondary digital divide. The second part focuses on people who do not have regular home internet access. Since one-to-one laptop students without home internet access are relatively new to urban and rural school districts, most of the investigation was focused on any digital divide in education, particularly in low-SES and rural areas.

The framework section will describe the learning theories that support the instructional technology pedagogy and 21st century practices in the digital classroom today, with a heavy emphasis on situated learning. The importance of these frameworks lies in the necessity of the use of these learning theories in current instructional technology practices. These theories are particularly imperative for those schools that have high Title I, a majority-minority enrollment, high ELL students, and a high number of low-SES students. These schools must keep their students current in educational technology for them to compete with their counterparts from schools that do not have their same ethnic or socioeconomic demographics.

Background of the problem. Most adults who were in school before the technology boom of the 1990s can remember their teachers and librarians using filmstrips, slides, movie projectors, VCRs, and VHS tapes as teaching tools (Veletsianos, 2016). These early instructional technologies had one primary purpose: to complement content in the classroom (Gagne, 2013). The use of these technologies was at the discretion of the teacher, were not interactive, and therefore, did not require much creative thought or were not student-center driven (Gagne, 2013).

Although teachers have used instructional technologies in their classrooms for decades, it was not until the 1980s, when microcomputers appeared in the school libraries that instructional technologies began to affect classroom curricula (Gagne, 2013). Computers had given students opportunities to discover and create digital projects. With the availability of computer labs came computer literacy courses to teach students the basics of keyboarding, word processing, and creating spreadsheets.

As technology has changed in the classroom, so must the methods on how content is delivered and received. Kong et al. (2014) stated that with the increased use of technology as a learning tool, learning must become more individualized and at the same time, learning must

expand outside of traditional classrooms. Social interaction and collaboration are vital to the use of instructional technologies. Digital learning must not only include classes contained in the traditional classroom but expanded to learning worldwide (Kong et al., 2014). These practices include video conferencing, interactive digital notebooks, and digital group projects where students and teachers can interact in real time.

Computers and pedagogy. The introduction of computers to most students in the 1980s was at the computer lab in their school. Although the computer labs were a popular place among students in the schools, students were limited to computer use to one day a week, particularly in primary grades (Gagne, 2013). As computers became smaller and more affordable, the technology curriculum in schools began to change.

Teachers began to see that for students to excel in instructional technology, they would need frequent access to computers (Baepler, 2014). Students began using programs they learned on computers, so it became necessary for school districts to purchase more computers. As laptop computers replaced desktop devices due to their mobility and cost, districts began purchasing laptops and carts for mobile electronic access from anywhere in the building (Gagne, 2013).

Just as technology changes, so does the demand for using it. Instead of students memorizing and regurgitating information, students show content knowledge by creating digital projects. As a result, the shift in instruction incorporated more 21st century learning methods (Gagne, 2013). The technology used for educational purposes has given students an unlimited amount of information at their fingertips. With pedagogical shifts in educational delivery becoming digital, there also had to be a shift in homework and project delivery (Kong et al., 2014).

Teachers began requiring students to turn in printed papers, projects, and multimedia content instead of those created from pen and paper. Computer labs became crowded, and there were never enough classroom computer carts in the school for everyone to use. Some districts began purchasing "class sets" to meet the instructional technology demand in their classrooms. School and public libraries with low SES enrollment, and those in rural schools became sanctuaries for learners who needed technology for learning but did not have it at home to use (Berdik, 2016).

School districts soon realized that although the demand for computers was high, giving each teacher a class set was expensive (Berdik, 2016). Libraries also had trouble keeping up with the demand for loaners since students still needed the computers after school hours (Berdik, 2016). Many district leaders then decided to implement their one-to-one laptop programs to meet the needs and demands of students and teachers alike. The one-to-one programs closed one digital gap among students but created another (Osborne & Morgan, 2016). Students without internet access at home were limited to how they could complete homework assignments.

Too much focus, however, has been on the emerging technologies and not enough focus on the emerging practices of instructional technologies, such as 21st century learning methods and STEM (Veletsianos, 2016). Many districts would purchase the instructional technologies without having a plan in place to implement how the ICTs were to be distributed and used. Some had not considered the professional development and teacher efficacy for these ICTs (Carter et al., 2016). School district leaders get excited about having the latest and greatest technologies in their schools, but once they get those technologies, educators wonder how to use these technologies to complement the content they are required to teach (Veletsianos, 2016).

Since one-to-one instructional technology practices in urban public schools are relatively new, the emerging instructional technology practices are underutilized (Veletsianos, 2016). While studies show that students now are all Digital Natives, meaning they have had access to information readily available all of their lives, a common false assumption is these Digital Natives therefore must possess all of the skills needed to do necessary word processing, keyboarding, or other skills required in an instructional technology environment (Patrikakou, 2016). Although they are considered necessary, classes such as keyboarding are often electives, or such as in the state of Texas, no longer offered (Meyer, 2017). This paradox plagues students from low SES environments who may have never had a computer or home internet, and therefore never have learned those skills at home (Vigdor et al., 2014).

The digital divide. The creation of the internet promoted instructional technology to flourish. Initially, the definition of the digital divide described people who had access to ICTs versus those who did not (Eynon & Geniets, 2016). Access to technology at home, namely the internet, and a personal computer, became not only a status symbol, but also an educational tool within the home. With the advances in technology in the 1990s and early 2000s, technology made every task more accessible such as banking, filing taxes, and even ordering take out (Patrikakou, 2016).

As mobile technology continued to advance, the digital divide became smaller in 2007 after Apple's introduction of the iPhone (Joan Ganz Cooney Center, 2016). Soon other companies followed with their cheaper versions of the internet-based and Wi-Fi compatible smartphone, more people have at least one type of ICT in their household; therefore, the digital divide redefined as the gap that separates the consumers of content on the internet from the producers of content (Osbourne & Morgan, 2016). In other words, the gap is between those who

use the internet for purchasing, social media, and entertainment versus those who use the internet to work, for education, and for creating content (Daughtery et al., 2014).

A study conducted by the Joan Ganz Cooney Center at the Sesame Street Workshop found 94% of children (ages 6 to 13) in a low socioeconomic group have access to the internet and Wi-Fi-enabled devices (Joan Ganz Cooney Center, 2016). This finding supports the idea that the initial digital divide gap has closed considerably. However, the same study also indicated that the new second digital divide is still considerably vast because of lack of regular home internet access. According to the study, 23% of the families interviewed had mobile-only access (namely a smartphone) and that 24% of the mobile-only families had a disruption of their internet services within the last 12 months of the survey due to inability to pay. Other findings included that 21% of the mobile-only families also share the ICT among multiple individuals, and therefore internet access for each person in the household is limited, and 29% of the mobile-only families often exceed their data plan limits, making regular internet access difficult to maintain (Joan Ganz Cooney Center, 2016).

Along with the emphasis on Science, Technology, Engineering, and Mathematics (STEM) modalities, project-based learning initiatives, and the increased use of technology in everyday life, it is even more critical now that students have access to ICTs and regular internet access (Patrikakou, 2016). In 2014, President Barack Obama and federal government leaders concentrated on getting high-speed internet and ICTs to classrooms, particularly in the lower-income and rural areas (Patrikakou, 2016). Even with these attempts, too many students are deficient technologically in their pursuit of education.

These findings have a significant impact on students who are in a one-to-one ICT program (Kong et al., 2014). In a one-to-one digital classroom, students use digital textbooks,

software, and Learning Management Systems (LMS) such as Blackboard and Google Classroom to complete digital homework, work collaboratively on project-based learning assignments, and participate in flipped classroom modules (where students learn content online at home instead of in the classroom). The ICT and the supporting digital tools and ancillaries available to students help bring instructional pedagogy from teacher-centered to student-centered learning, which empowers students to take control over their learning and to become producers of digital content (Fan-Ray & Hwang, 2014).

However, many students who have the same Wi-Fi-enabled ICT device cannot do their digital homework because they do not have regular and reliable internet access at home (Enyon & Geniets, 2016). The challenges for these students to do the same homework on the same computer as their counterparts, but without the same regular home internet access is a problem. This digital divide at home, therefore, hinders students' achievement simply because of their lack of regular home internet access (Rogers, 2016). In other words, the digital divide is present in the digital classroom; all students have the same advantages at school, but the divide is still present at home.

Payne (2015) discussed the problem with one-to-one ICT programs where districts purchased a device for each student but then realized that many students did not have internet access at home. Payne suggested that districts implement a plan before deploying instructional technology in schools, particularly Title I schools. One of the recommendations was to make sure both teachers and students were trained on how to use the devices. According to Payne (2015), many students who come from low-income backgrounds may not have the same experiences with ICTs that their classmates have because they have not been exposed to them.

In 2013, Armadillo Independent School District (AISD), a pseudonym for the research site implemented its first one-to-one program to provide one-to-one iPad 2s to all students in grades 7–12. At the time, there was a technology deposit fee of $50 for the student to obtain an iPad. The district reduced the deposit fee to $10 for students who were on the free-reduced lunch program. Even with the fee reduction, the iPad one-to-one program was not very successful because some parents (many with multiple children in the district) could not afford the technology fee.

In order to make the district a valid one-to-one program, in 2015 the AISD introduced the district one-to-one laptop program. What made this program different was there were no technology fees, and therefore, every student received a laptop at the beginning of the school year. In the last four academic years, the AISD appeared to have a solution in order to reduce the digital divide.

AISD provided students in grades 7–12 with a Dell laptop to use throughout the school year in order to support 21st century and district STEM initiatives. The instructional technology goal for the district is to support 21st century learning initiatives to close the gap of the digital divide and to prepare students for future jobs in science, technology, engineering, and mathematics (Armadillo ISD, n.d.). Since students in elementary and intermediate campuses use iPad or Chromebook class sets to incorporate digital learning in their classes, the focus of this study will focus on middle school students.

One of the dilemmas that have arisen from the district's one-to-one program is that students are assigned digital assignments and homework to complete, without the teacher knowing which students are without regular home internet access. (Voogt et al., 2013). Some students may divulge that information to students; however, many may not for shame and fear of

ridicule from their peers. Those students must then figure out how they can complete their digital assignments without affecting their grade negatively (Vigdor et al., 2014). Other students use their smartphones as hot spot Wi-Fi access ports so they can get their homework done. However, many students do not have unlimited data plans or may share their data plans with other members of the household (Joan Ganz Cooney Center, 2016).

There is no longer a digital divide in the secondary AISD brick, and mortar classrooms since every student have the same access to ICTs and internet while at school; however, there was no preparation for the unforeseen digital divide between the students who have the internet at home and those who do not. The authenticity of learning in a 21st century environment is crucial since all assessments need to be aligned with real life situations (Giannakos, Pappas, Jaccheri, Sampson, 2016). It is essential to address the digital divide because the authentication piece will not be present if the collaboration piece outside of school is lacking. For these reasons, student achievement in one-to-one instructional technology for middle school students without home internet access is the focus of this dissertation.

Theoretical Framework

The theoretical framework in this qualitative study comes from the situated learning theory from Lave and Wenger (1991). Situated learning has three components: legitimate peripheral participation, the knowledge presented in authentic contexts, and community of practice. These three components allow the learner to participate in their own learning experience actively.

This theoretical framework begins by examining a learner's legitimate peripheral participation, which puts embedded learning into three categories: the learner's culture, activities, and context. The second component states that for the learner to obtain knowledge, the

teacher should present lessons in authentic contexts. The third component shows that learners acquire knowledge through interaction and socialization (see Figure 1).

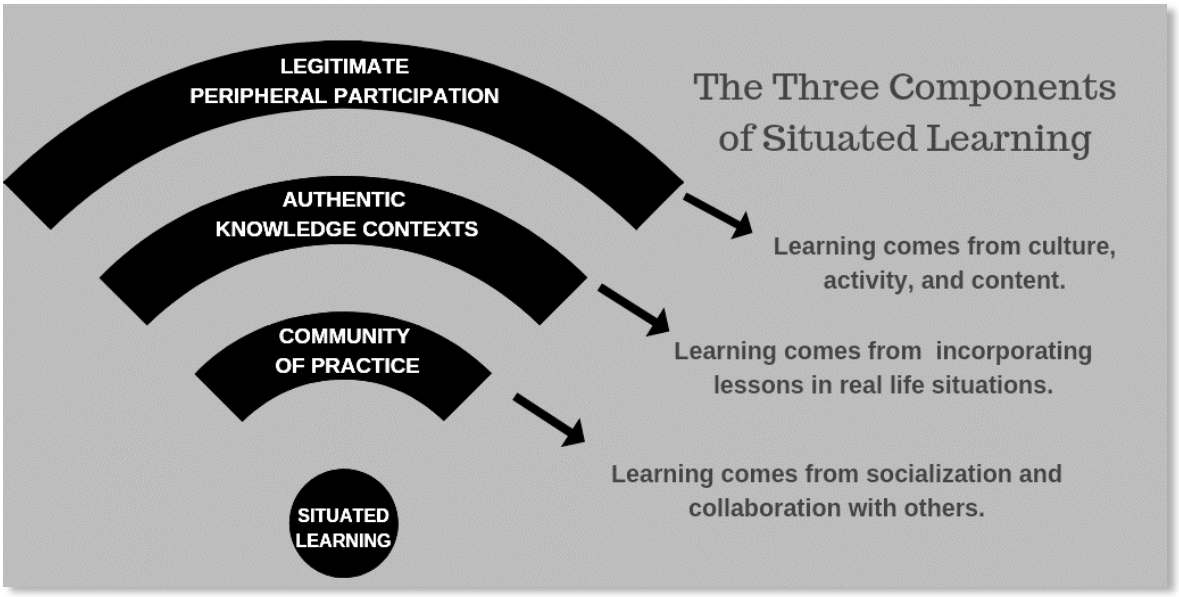

Figure 1. Lave & Wenger's (1991) three components of the situated learning theory. (Flinner, 2018).

The theoretical framework for this study illustrates the similarities of situated learning and the 21st century learning skills required by school districts in one-to-one programs. The 21st century learning model focuses on collaboration, communication, critical thinking, and creativity. In a situated learning environment, such as in a one-to-one ICT environment, learning is based on activity in and with the world, involving the individual and moving beyond the reception of factual knowledge (Lave & Wenger, 1991).

In the situated learning theory, the acquisition of knowledge comes from the cooperative and participatory methods of teaching (Stein, 2017). One of the positives of situated learning is that the teacher facilitates learning, but most importantly, directed by the learner in where the learner obtains knowledge from others. The situated learning theory in a one-to-one ICT environment has likenesses with 21st century learning methods. When comparing situated

learning and 21st century learning methodologies, there are quite a few similarities. (See Figure 2).

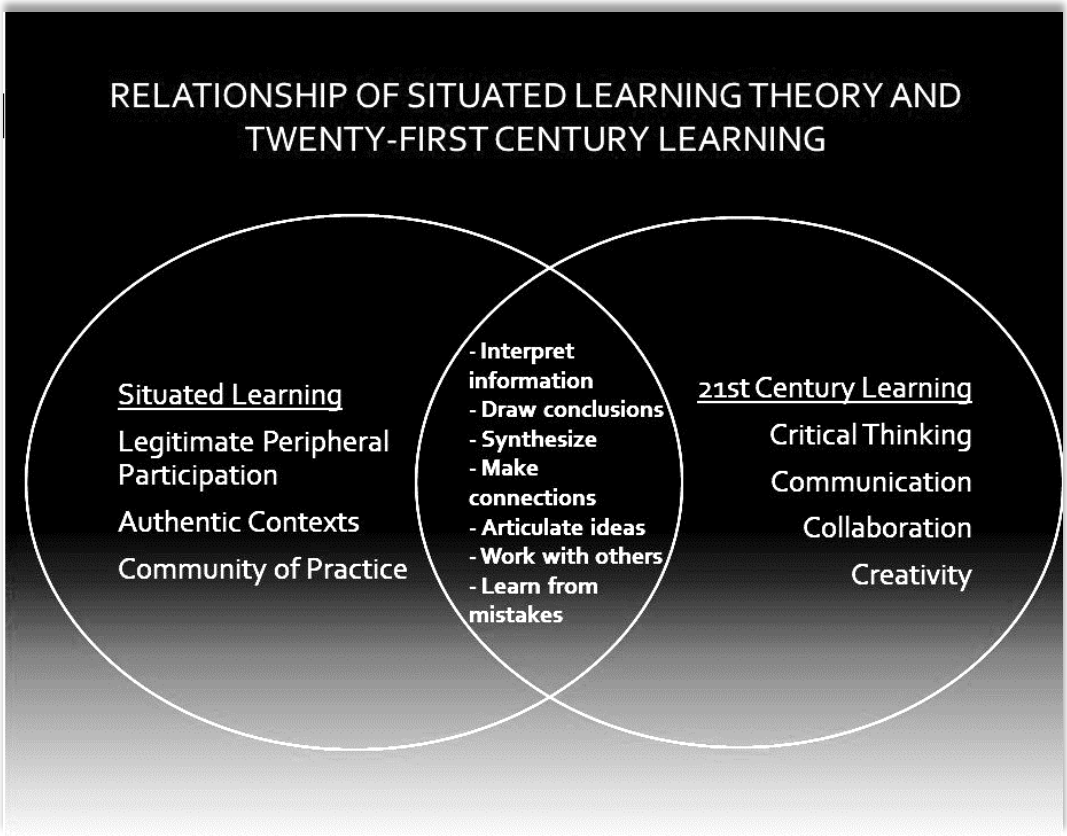

Figure 2. Relationship of Lave & Wenger's (1991) Situated learning theory and The Partnership for 21st century learning's framework (2011). (Flinner, 2018).

Situated learning emphasizes student-centered learning, which not only means that the student is learning from the teacher but most importantly, the student is learning from trial and error from themselves and their peers. According to Stein (2017), in situated learning, the social learning process is dependent on the practice and not necessarily the outcome. This method helps students not only learn but also retain the information learned the collaborative process.

Situated learning requires that the learning come from experiences, dialogue with others, and the context of the lesson. In order to be a part of the community of learners, all learners must have the same resources (Stein, 2017). Developing this community is evident not only in

pedagogy but in the business world as well. Many jobs require a person to be a productive employee, which entails the person to be a good decision maker, communicator, as well as a problem solver (Baloian & Zurita, 2015).

Since many districts are emphasizing college and career readiness, using the situated learning theory found in 21st century learning methods would be beneficial. If all employees had the same situated learning training and resources, then all can help search for solutions, generate ideas, in order to problem solve and identify any opportunities using the skills learned in school. Therefore, working within real-life 21st century learning situations in the classroom can give students the practical experiences they need in order to work with others well beyond their formal learning.

For these reasons, the 21st century learning modalities help students prepare for future careers by using the 4C's in collaboration with instructional technology: collaboration, communication, critical thinking, and creativity. (The Partnership for 21st century learning, 2013). These skills are critical for students to experience and master in their formal learning as they go through their primary and secondary educational levels. The situated learning theory therefore is instrumental and complements the 21st century methods well.

The theoretical framework also takes into consideration the importance of the social aspect of shared learning (Zydney & Warner, 2016). The commonalities between the situated learning theory and 21st century learning strategies benefit the one-to-one laptop student. Lave and Wenger (1991) stated:

> Shared participation is the stage on which the old and the new, the known and the unknown, the established and the hopeful, act out their differences and discover their

> commonalities, manifest their fear for one another, and come to terms with their need for one another' their thesis stressed regularity in the outcomes of practice (p. 116).

The social aspect of shared learning, therefore, needs to be included as an essential component of a student's formal learning.

It is essential to understand that the educational setting in which a student is learning is essential in the retention of the content (Housley-Gaffney & Kercsmar, 2016). The social context of the learning process cannot be mastered solely by face-to-face synchronous meetings but must also include asynchronous contact and virtual meeting spaces. By using non-traditional instructional methods to complement mandated content, students are more than likely learn and retain information if they can experience the process of situated learning (Housley-Gaffney & Kercsmar, 2016). The situated learning theory negates and replaces the use of memorization (a traditional process) as a method of learning.

In this study, Armadillo ISD students have the same equipment while at school; therefore, there is no digital divide present, and students can learn using 21st century skills via situated learning. The challenge is when the students who do not have home internet access try to complete their assignments, group work, and peer collaboration (Daugherty et al., 2014). The students without internet at home will not have the same situated learning experience as required in their 21st century learning modalities. Without the same situated learning experiences as their counterparts, the students may have an adverse effect on their digital experiences, grades, and overall academic achievement. The impact on the student's academic achievement not only influences their learning, but it also has an impact on their life skills after they finish their formal education. The impact would also affect any future job prospects for the student, making them ineligible for many of the jobs that 21st century skills would afford.

Review of the Literature

The purpose of the study is to explore how eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas. This review will evaluate the Technological Pedagogical Content Knowledge (TPACK) standards as it relates to digital learning. The benefits of one-to-one instructional technology use as it pertains to pre-K–12 learning is also discussed in this section. This section also describes the use of 21st century learning methodologies in relation to digital instruction, as well as a review of the methodological issues. A synthesis of the research findings is also included in this chapter. The literature review also presents the empirical, theoretical, and practical frameworks that support the framework for this study. The literature review will also review the methodological issues surrounding the digital divide, a synthesis of research finding, as well as the critique of previous research.

Digital pedagogy. For instructional technology programs to be successful, teachers must understand the uses and best practices of digital learning as it pertains to their curriculum (Voogt et al, 2013). Instructional technology and pedagogy are no longer two separate entities, instead, they need to be synonymous. The Technological Pedagogical Content Knowledge (TPACK) conceptual framework complements traditional pedagogical practices by integrating general practices with instructional technology (Voogt et al, 2013). According to Agyei & Keengwe (2014), TPACK is a combination of three components: content knowledge, pedagogy knowledge, and technology knowledge. In order to effectively teach in a one-to-one learning environment, these three elements must be mastered.

Research however has shown that students tend to do well in online assessments if they are familiar with online assignments in the classroom as well as at home (Agyei & Keengwe,

2014). The electronic assessments used for data collection on students' knowledge of content attributes to this success. The students appear to model the digital learning skills from what they learn in the classroom. These successes can also be duplicated from the home in the form of digital homework assignments (Agyei & Keengwe, 2014). The successes, however, were developed by digital programs that follow the TPACK framework, and not necessarily by educators using TPACK to create their digital lessons.

The adaptation of TPACK or other digital learning methodologies such as SAMR (Substitution, Augmentation, Modification, and Redefinition), and 21st century learning skills are becoming more common in classrooms. Teacher evaluations and classroom walkthrough requirements have now included effective instructional technology uses in lessons (Texas Education Agency, n.d.). Principals are now evaluating teachers' use of technology in the classroom as to how they students are participating in meaningful digital activities within their lessons (Texas Education Agency, n.d.).

Kuo and Hwang (2014) conducted a study on how to teach and improve problem-solving strategies for students using instructional technology. In this study, 170 fifth grade elementary students from Taiwan were put through a five-cycle learning cycle approach. Students were evaluated based on their e-portfolios submitted for this study. The researchers wanted to know if students' web-based problem-solving performance was related to their problem-solving ability. They also wanted to know if there were any sub-abilities relating to web-based problem-solving ability can be found via the students' e-portfolios. They also wanted to find out what factors affected the students' web-based problem-solving performance were included in the students' information-searching portfolios.

The five phases used for to answer the research questions for this study are prior knowledge construction, keyword adoption, information identification, information abstraction, and thinking elaboration. In the first phase, the researchers established the content that the students knew before introducing the web-based problem-solving exercises. During the second phase, teachers gave students keywords and synonyms to use for their research. In the information identification phase, the teachers would guide students to identify reliable primary sources for their assignment, including how to be critical of information found online. In the fourth phase, students were taught how to bookmark and save their online sources in order to retrieve them later. In the final phase, thinking elaboration, students were required to demonstrate their knowledge on the topic they researched. "This phase also offers an opportunity for peers to reflect on what they have done, which is consistent with both Piaget's theory of cognitive development and with the theory of social constructivism" (Kuo &Wang, 2014, p. 173).

The findings of this study show that the students' web-based problem-solving skills as well as their problem-solving abilities improved using the five-cycle phase. The researchers credited the approach based on the problem-solving theory where students were required to solve social issues following the five-phase learning cycle online. Since the students used cognitive and social environmental factors, the research shows that the situated learning theory works, and it emphasizes the importance of 21st century learning skills to students in grades pre-K–12.

Computer-based assessment. To support 21st century learning methods in order for students are college and career ready, it is important for learners to experience the constant changes of technology in their classrooms. As the digital instructional devices change, so must the delivery of content (Kivunja, 2014). For example, teachers used to ask students to raise their

hands if they understood the content. As technology changed, the manual hand raise was sometimes substituted by classroom clickers. The classroom clickers were soon replaced with online formative assessment tools such as Kahoot!, Nearpod, and functions in learning management systems.

Instructional technology has changed what and how information is taught in the classroom, and most importantly, how students reveal their understanding of the content being taught. Since ICT devices have become more affordable, access to technology has led to a transition in content delivery from traditional paper and pencil testing to the use of computer-based assessments (Agyei & Keengwe, 2014). As more classrooms use online classwork and homework, students will adapt the learning experience to the online formative assessment methods, including benchmarks. As students use the ICTs throughout the school year, their experiences will easily transfer when they are required to take a computer-based state standardized assessment. As students master these skills, they can be easily transferred to college classes and careers in later years.

Students who have access to ICTs and internet both at school and at home may be more comfortable and familiar with digital learning method, and therefore they may perform better on an online assessment. Online state assessments, such as the State of Texas Assessment of Academic Readiness (STAAR) will be issued completely online in the next five years (Texas Education Agency, n.d.) and students alike considering many of their benchmarks are already taken by students in an online format, such as Data Management for Assessment and Curriculum (DMAC), iStation, and iReady.

Vigdor et al (2014) conducted a study to determine if having access to a computer and internet at home was advantageous to students and their academic achievement. The study was

conducted in North Carolina among minority students and those with a low socioeconomic status. The study concluded that students who obtained both computer and internet access at home saw a significant decrease in reading and math test scores in the fifth and eighth grade levels. The researchers concluded that students who do not have properly guided parental supervision of their child's computer and internet use were more likely to score lower on their formative assessments than children whose parents actively monitored their screen time.

Benefits of one-to-one instructional technology use. With the introduction of one-to-one programs in schools, districts use different devices to use in their instructional technology programs. Although laptops, Chromebooks, and tablets operate differently, and may have different operating systems (Apple, Windows, and Android), they are all Wi-Fi-enabled devices used to deliver digital content to students. Despite the use of these different Wi-Fi devices, there are a number of studies that support the use of one-to-one technology use in schools.

A series of 10 studies by Zheng et al. (2016) showed that laptop programs among these studies showed a significant increase in scores in English, writing, math, and science courses. The studies also showed that students began using the laptops for classes other than their core courses, and personal uses that they would not otherwise have experienced without the devices. "More student-centered, individualized, and project-based instruction; enhanced engagement and enthusiasm among the students; and improved teacher-student and home-school relationships" (Zheng et al., 2016, p. 1075). The studies showed a positive impact to scores.

In another study, Clarke (2016) conducted a mixed methods study to see if student use of one-to-one laptop programs increased scores on a reading assessment. The quantitative results of this study indicated a positive relationship between the frequency of use of laptops for schoolwork and increased scores on the reading assessment, whereas students who rarely used

the laptop for schoolwork showed a decrease in the same reading assessment. The students who showed lower scores were more likely to use the laptop for entertainment and social media than schoolwork. In the same study, the qualitative results showed that the lack of Wi-Fi at home was one of the barriers to student achievement. The one-to-one laptop program proved to be a decisive factor in student learning in Clarke's study.

Other uses of one-to-one technologies focused on the Common Core State Standards (CCSS), which was implemented in 42 states (Alabama, Oklahoma, Texas, Virginia, Alaska, Nebraska, Indiana, and South Carolina did not adopt these standards into their public schools). A study by Hodgkin (2016) researched a California school that incorporated the SAMR (Substitution, Augmentation, Modification, and Redefinition) into their CCSS lessons. One of the results of the mixed methods study indicated that the technology was used to augment more than 50% of the lessons, and the teachers in the same study stated that their experiences with a one-to-one laptop program were positive and believed that all schools in California should have one-to-one laptop programs in their secondary schools.

Student preference, although not considered on most of the studies in this literature review, is something that researchers should be reflected in future studies. Ellison (2017) showed that traditional subjects, such as English Language Arts and Reading, can successfully meet conventional standards. A student in the Ellison study participated in a literacy lesson that incorporated the online game Minecraft to practice and master the art of storytelling.

The benefits of one-to-one ICT programs in schools have shown to be a positive learning environment and experience for students. The use of one-to-one instructional technologies in the classroom appears to be a benefit for students in order to prepare them for STEM and other technical careers. The ICTs promoted communication, collaboration, critical thinking, and

creativity among the student in Ellison's study. These skills allowed real-life experiences, trial, and error, and gave this student ownership in his learning, all while enjoying the experience because the process did not feel like the student in this study was learning; instead, he was doing something he enjoyed at home: playing video games.

21st century learning methods. Rogers (2016) stated that although most students know how to use ICTs for consumption, few low-income and minority students know how to use ICTs for production. In order to get students to use ICTs to promote creativity, critical thinking, collaboration, and communication, it is vital that students learn to integrate their learning using digital methods (Rogers, 2016). In attempts to help students succeed in their homework and projects, a few practical studies have shown that 21st century learning focuses on work. For example, Kou and Hwang (2013) found that student achievement and content retention improved significantly among elementary school students when they were allowed, so do web-based problem-solving lessons at school.

Bartholomew and Strimel (2018) researched 708 middle schools using an open-ended 21st century curriculum design to see if such methods were effective in student achievement and therefore preparing students for future careers. Their findings indicated that the majority of students were able to adapt well to the open-ended design problems both in and out of school and were comfortable doing so. The researchers suggest that one way of increasing student success is "by affording students more opportunities for completing open-ended design problems in school settings" (Bartholomew & Strimel, 2018, p. 776). Students reported that the lessons were fun, engaging, and more creative than traditional methods even though these lessons were considered more difficult.

One method to shorten the digital divide was the use of mobile internet buses and libraries that check out Wi-Fi routers to students. For example, the San Francisco Library has a TechMobile lab that has a computer lab, Wi-Fi and instructors on board travel to underserved neighborhoods to offer lessons in basic computing applications, block-based coding, Lego Robotics, and 3-D printing. (Berdik, 2016).

Some school districts have collaborated with mobile technology companies to provide Wi-Fi enabled devices and low or no-cost internet access. For example, Broward County, Fla. libraries and schools teamed up with T-Mobile to offer low-income students tablets and internet access to selected students who may not have internet and device access in their homes. Although good in theory, the program only has only 300 tablets and access points, and there are unfortunately more students than there are devices (Enis, 2017).

While some teachers are leery of using technology in their lessons for fear of students using the technology for social media and gaming, other educators have become sneaky in incorporating instructional technologies into their curriculum. Teachers have successfully used the technology that students use daily in order to teach lessons (Rivers, 2017). Programs such as Kahoot! and Edpuzzle gaming apps to engage the students in learning by making them a part of the process.

Although many teachers are weary of using video games as a tool for learning, studies show that gamification makes a positive impact on learning, as well as retention of the content learned. Gamification allows students to play, experiment, and problem solve while completing certain tasks in their lessons. These exercises allow students to practice the 5Cs of 21st century learning in a fun and interactive learning environment.

Teachers who have incorporated gaming, interactive web sites, and other digital sources have redefined content delivery, making it interactive and fun and therefore not making it seem like they are learning. These methods have transformed content delivery, making 21st century learning fun, and at the same time, students are more than likely to retain the information taught (Rivers, 2017).

Socioeconomic and geographic factors affect students' 21st century skills and their college and career readiness (The Partnership for 21st century learning, 2013). "Skills in technology can be instrumental for individuals to increase their social position and capital. On the other hand, lack of access and skills in ICT can further disenfranchise already marginalized groups" (Rogers, 2016). With the many disadvantages that low SES students already have, the digital divide will only make the learning gap wider.

In a study conducted by Kong et al (2014), they addressed closing the achievement gap for students by teaching 21st century learning skills. In this study, they discovered six research issues critical for e-learning in school education. The first issue addressed by the researchers is to establish the 21st century learning goals for the students so that the goals are aligned within the school or district. The researchers then suggest that the curriculum must be aligned to bridge of the gap between schools' curriculum delivery and a students' real-life situations.

The third research issue relates to the realization of learning process of developing learners for 21st century skills. "It concerns the adequacy and relevance issues of curriculum delivery, in order to allow learners to adequately access resources and scenarios that are related to real-life problem-solving when they develop 21st century skills" (Kong, et al, 2014, p. 74). This issue requires that teachers actively engage students in their lessons as well as making the lessons relevant to the students' real-life experiences.

The fourth research issue is for districts to conduct a needs assessment by collecting data to determine if the 21-century curriculum is effective, as well as adjusting the curriculum as needed. The needs assessment could also determine whether more professional development and teacher training is necessary. The fifth and sixth research issues relate to the assessment of learning outcomes and teacher development for facilitating learners to develop 21st century skills respectively.

In order to decrease the achievement gap, the researchers in this study recommend the stakeholders to consider policies on the goal-setting of curriculum that address and encourage 21st century skills development. They also suggested to bridge the gap between school and society by making ICTs available for all students. The researchers also encouraged stakeholders to focus on teacher development in instructional technology best practices for pre-service and in-service teachers.

Review of Methodological Issues

The review of the methodological issues in the selected research included quantitative, qualitative, and mixed methods. Researchers who used the qualitative methods relied solely on their questionnaires and interviews to determine the findings of their research. The strength of this type of study for this category is that these numeric results are more accurate if there are no opposing factors present (Onwuegbuzie, 2000). The weaknesses in this type of study for this topic is that it does not consider the circumstances of the individuals in the study that may alter the actual outcome of the findings in the study. “As such, internal validity is threatened when plausible rival explanations cannot be eliminated” (Onwuegbuzie, 2000, p. 6).

For example, a nonexperimental design focusing on a causal-comparative analysis of the one-to-one program and its effects on improved standardized testing scores on the Carolina from

the 2012–2013 state science assessment showed some improvement in scores among Title I, students. The study, however, did not consider if the students had tutoring, teacher and school interventions, or other preparations that would help increase scores (National Center for Education Statistics, 2012). The data shows the scores; however, it does not show the reason behind those scores. Getting qualitative data, such as interviews, questionnaires, and focus groups, could discover the reasoning behind these numbers.

With the qualitative data, changes could be implemented to improve test scores even further. To use only data to attribute the increase in scores to laptops may not be an accurate representation of what caused the increase in scores. The mere use of laptops does not generally increase standardized test scores alone.

Other authors chose the quantitative methods, relying strictly on numeric data to summarize their findings. A few of these studies focused on whether one-to-one ICT programs helped improve test scores (Miller, 2017). The strength in this type of study for this category is that the researcher can see the numeric statistical results that a strictly qualitative study may miss. The disadvantage of this type of study for this topic is missing the subjective statistical portion of the study which may further explain the results of the numeric data.

Most of the qualitative studies relied on their observations, interviews, and questionnaires in order to reach their conclusions, but they are missing the data that either supports or contradicts their argument. For example, in a study about digital divides in a rural community, the researcher uses an open-ended, online questionnaire to teachers about technology practices in the classroom (Cumbee, 2017). The researcher used only the questionnaires for her findings, using a Likert Scale to collect her data. One of the common factors in Cumbee's Likert Scale

survey was that teachers found it frustrating to teach using instructional technology when there is a problem, such as Wi-Fi disconnections.

Using the above information from the Cumbee (2017) study, making determinations is misleading and leaves the reader with a few questions: (a) How often are the glitches and malfunctions happening?; (b) Are the glitches and malfunctions due to user error?; and (c) Are the teachers receiving technological professional development to learn how to fix some of the glitches so that instructional time is not interrupted? The researcher needed more data in order to indicate the needs of these teachers in instructional technology, perhaps data from the technology department and professional development personnel who could perhaps clarify these questions.

Most of the authors have followed a mixed-methods methodology taking both questionnaires/interviews and data into account when making their discoveries and reporting their findings (Stiefel, 2016). The strength in this type of study for this category is that all bases are covered, and the cumulative findings from both research methodologies give an excellent and accurate result that genuinely represents the intended research study results for the researcher. The weaknesses in this type of study for this topic is to focus on one method over the other, and vice versa, therefore unintentionally swaying results one way or the other.

After reviewing the research methods, a qualitative research process would give the best results for this study. The qualitative research processes the data from a focus group discussion can help identify themes that describe the issues that are most pertinent to the problem and help separate the dimensions of a problem (Wolf et al., 2017). The qualitative research method is a narrative as to why a phenomenon happens, and therefore, action can be taken to remedy the problem in the subject matter.

According to Crouch and McKenzie (2006), a qualitative study with interviews seeks to go past what the data reveals, but instead, find out the meaning behind the data to get a better understanding of the problem in the study. The combination of data-driven research, questionnaires as well as observations and one-to-one interviews of all parties, will best benefit this study, but most importantly best serve those who the research for: the students.

Synthesis of Research Findings

No longer can technology and education be two separate entities, but instead need to be recognized as the new pedagogy standard (Bancroft, 2016). The research for this study supports this stance. There appears to be a great misunderstanding between educators and students when it comes to digital learning. Teachers assume that since students are digital natives, they automatically have the necessary digital literacy skills needed for e-learning. The assumption is false, and therefore repeatedly teachers discover that they must teach and demonstrate these skills (Vigdor, 2016).

Another misunderstanding is that schools are required to teach these digital skills to all students (Kivunja, 2014). The Texas Education Agency stopped requiring computer education classes in high school as a requirement for graduation, so students who do not have personal computer access at home are more likely not to have these digital skills needed for successful digital learning (Texas Education Agency, n.d.). The lack of technology courses is especially troubling since most people agree that necessary digital learning skills are a necessity for the success of students after graduating from high school.

According to Patrikakou (2016), having digital equipment does not immediately constitute digital literacy. Teachers should not assume that all students know how to use all technologies, particularly all instructional technology pieces. Even if the digital natives have

digital access at home, many times, digital knowledge does not go beyond social media, videos, and gaming (Patrikakou, 2016).

Skills in technology can be instrumental for individuals to increase their social position and capital. On the other hand, lack of access and skills in ICT can further alienate already marginalized groups (Rogers, 2016). “Low-income families continue to lag when it comes to gaining access to ICT, often evokes thoughts about different online technologies, but successful projects are content-driven, not technology-driven” (Daugherty, 2014). Even with families who only have mobile access as their internet access, these families are more likely to use that access for entertainment and social media rather than educational purposes (Joan Ganz Cooley Center, 2016).

The theoretical framework supports the need for situated learning in a 21st century learning program. By incorporating real-life lessons to not only teach content but can also teach student digital literacy skills, including digital citizenship, that they can use outside of their formal learning. “Most of the used features include digital tools in order to enhance the students' motivation, their learning skills, the collaborative work, and the constructive knowledge acquisition” (Gorghiu, 2014, p. 547). There is a positive correlation between students in a digital learning environment and student interest and engagement.

Critique of Previous Research

With attempts to make the research literature timely, much of the research the authors have used are out of date, making some of the research attempts invalid or technologically archaic. These findings are not a direct criticism of the researchers themselves; instead, it is a statement that there needs to be more current research on this study. Covering the digital divide

is not enough for the study; it is a small part of the big picture of pedagogy and student achievement in 21st century learning.

Pedagogical research, in contrast, has not changed very much in the past decade. The problem with this is not much research has combined instructional technology with pedagogical methods. Many educators still feel that learning and e-learning are two separate entities, with some refusing to incorporate digital lessons until they are forced to do so.

Some of the one-to-one ICT literature focused on principal and teacher attitudes towards instructional technology (Voogt et al., 2013). Other research mentioned the lack of internet access at home for students to complete their assignments, but not addressing how it affects the student, only focusing on how it affects the teacher. Some teachers gave up on using technology in their classes because they lacked training on how to differentiate homework for students who do not have internet access. For them, it was just easier to go back to traditional delivery methods.

Most of the studies in this realm focused on administrator and teacher behaviors and attitudes, and not on student achievement (Carter et al., 2016; Voogt et al., 2013). Veteran teachers seemed to have trouble adjusting to instructional technology, whereas new teachers, many of them millennials, have mastered 21st century learning methods into their daily class routines (Carter et al., 2016). Although teacher efficacy in instructional technology is a concern (Carter et al., 2016; Voogt et al., 2013), this is irrelevant to the research topic.

Other research suggests that access to computers and internet at home does not reduce the digital divide, instead expands it. Vigdor et al. (2014) conducted their study on Carolina public school students, which showed that students with home computers and home internet access negatively affected math reading scores. In this study, they did not negate the positive effect that

home computers can have on student achievement; however, they did find that the adverse effects came from less time online to do schoolwork and more time doing social media and gaming (Vigdor et al., 2014). Also, nowhere in the literature did it mention classroom and home strategies for technology management by the adult for the child to remedy the adverse effects of time on ICTs.

To contradict the Vigdor, et al. (2014) study that claims access to home computers and the internet can expand the digital divide, Rivers (2017) suggests that computer simulations and gaming not only help students with critical and creative thinking but also with critical and creative problem solving, which supports student-centered 21st century learning strategies. Rivers (2014) states that digital simulations and gaming can enhance cognitive development from different learning styles and abilities. “A very important characteristic of computer simulations and games is the ability to embed prompts that allows both designer and learner to change, edit or modify the learning environment based on the different learning styles of the users” (Rivers, 2018, p. 21). These 21st century learning strategies allow the learner to take ownership in their learning by simple trial and error methods.

Chapter 2 Summary

Although one-to-one laptop programs dramatically decreased the digital divide among students, it created another problem with the mandate of the use of these laptops to complete homework, participate in flipped classrooms, and collaborate with other students without considering the students who do not have regular internet access at home. The digital divide among students without home internet access gives teachers an additional challenge in their classrooms because they will have to figure out how to differentiate digital homework. Teachers

are trained in instructional technology integration, but they are not trained on how to implement the same homework to students without internet.

It is evident that there is a second digital divide in the one-to-one classrooms. (Vigdor et al., 2014). Title I and rural schools have a high number of students without regular home internet access (Dolan, 2015; Harris & Pollock, 2015; Meyer, 2016). Students who do not have the internet at home may not have the necessary 21st century learning skills needed for college or qualify for STEM careers (Osbourne & Morgan, 2016; Rogers, 2016).

Based on the premise of the literature researched, there appears to be a significant positive relationship between internet use for learning and high academic achievement (Zhang et al., 2015). “Narrowing the digital divide for this age group has many implications for the acquisition of skills and study habits, and consequently, for the realization of individual potential” (Zilka, 2016). Evidence suggests that providing high-speed Internet access would broaden, rather than narrow, math, and reading achievement gaps (Vigdor, 2014).

This literature review has validated the need for further studies on the impact of student achievement when students do not have regular internet access at home. This study will discover student perception of those who do not have regular internet access at home. This study will also ask these students without home internet access if they feel they are more than likely to score lower in homework assignments, Project-Based Learning assignments, assessments, as well as collaborative learning course work with their classmates.

Chapter 3: Methodology

Introduction

The purpose of this qualitative research study was to explore how eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas, and how that may affect their student achievement. Data for this study was collected from questionnaires, interviews, and focus groups from a middle school in Texas. The research question was stated and described the selected research design. The population, sampling method, and sample size was described in detail. An explanation of data collection methods and analysis procedures are presented along with how possible threats to validity.

Statement of the Problem

The problem for this study was how do eighth-grade students perceive the use of a one-to-one laptop program, in a middle school in Texas without regular home internet access. The researcher wanted to uncover the experiences of students in a one-to-one laptop program who do not have internet access at home and to determine if it negatively affected their student achievement. The researcher also hoped the data from the study will assist in policy updates and changes for all students in one-to-one ICT programs.

Research Question

The research question was developed by reviewing the literature on the use of instructional technology in schools and its effect on learning. The research question that guided the study was:

> How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

The research question focused on the use of instructional technology within the confines of a program of choice within a Title I middle school in an urban/suburban district in Texas. The students in the program have all participated in the one-to-one laptop program for the last two school years.

Purpose and Design of the Study

In the 2016–2017 school year, the Texas Education Agency implemented a new teacher appraisal system the Texas Teacher Evaluation and Support System (T-TESS) which for the first time implemented state-mandates on instructional technology use in the classroom using Bloom's Taxonomy, the SAMR (Substitution, Augmentation, Modification, Redefinition) model, and 21st century learning strategies as their guide. In the Standards and Alignment category, teachers design lessons that are organized, reflect best practices, and are created for diverse learners. For example, teachers who are rated "distinguished" in Standard and Alignment successfully integrate technology to enhance the mastery of student achievement goals. (TEA, n.d.). Teachers who do not use technology in the same standard are rated as either "developing" or "needs improvement."

The 'distinguished" designation is considered "student-centered actions" whereas the "developing" or 'improvement needed" designation is considered 'teacher-centered actions" (TEA, n.d.). The T-TESS standards focus on a student-centered learning environment rather than the former teacher-centered setting. In the planning dimension of T-TESS, a teacher should plan lessons that are engaging and flexible that emphasizes higher-order thinking. A 'distinguished' teacher actively uses technology and other resources that actively engage students in the ownership of their learning, again scoring the highest for student-centered actions. An

"improvement needed teacher" misaligns technology and other resources for instructional purposes (TEA, n.d.).

Creswell (2013) described qualitative research as investigative research used to gain an understanding of reasons and motivations of a selected group. Qualitative research can also provide an awareness of problems, which can lead to future research on a topic. According to Wolf (2017), qualitative research can reveal patterns by using data; however, the data is clarified by using the thoughts and opinions of those being researched in order to clarify data findings, particularly with small sample groups. These findings were determined by using questionnaires, interviews, observations, and focus groups (Wolf, 2017).

This qualitative case study was designed to explore the perceptions of students in a one-to-one laptop program for those students who do not have regular home internet access. This case study added to the literature by identifying how middle school students in a one-to-one laptop program perceived the program without having regular home internet access, and if that limitation affected their student achievement.

This information can help educators, instructional technologists, and families on current practices, future planning, and best practices for students in a one-to-one ICT program. Creswell (2013) stated that "Qualitative research begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems in inquiring into to the meaning individuals or groups ascribe to a social or human problem" (p. 37). Therefore, the qualitative research method was chosen to not only show data but more importantly to explain the reasons behind the data (Wolf, 2017).

After exploring other designs, the best way to answer the research question for this dissertation was to conduct a case study to determine the effect of scholastic achievement in a

one-to-one laptop program with students who do not have the internet at home. According to Yin (2008), case studies provide researchers understandings of social settings all while maintaining the essential characteristics of the subject's everyday situations. Through this case study, the selection of individuals, method of data collection, and method of data analysis was all best suited for this qualitative study. The students selected for this study were all in the Trailblazer Academy, a pseudonym, a program for students who are designated by the Armadillo ISD as at high risk for not graduating.

The qualitative strategy of the current study explores middle school one-to-one student attitudes and perceptions of the use of ICTs in their classrooms (where they have internet access), and at home (where they lack internet access). The data was collected through questionnaires, interviews, and focus groups. The questionnaire helped identify students who do not have regular access to the internet at home. Interviews discovered the individual experiences of students who lacked home internet access and how it affected their academic achievement. Finally, the focus groups explored the similarities and differences of understandings of student perceptions and mindsets toward educational technology and how not having home internet affected their studies.

Population and Sample Selections

The criteria for the sample middle school students included being enrolled in the Trailblazer Academy (a pseudonym for the program), a school of choice within the Armadillo Middle School (a pseudonym for the school in the study), a campus with a Title I designation. The Title I designation is based on the number of low-income students who are considered at-risk for school achievement. For a school to be considered a Title I school, a minimum of 40% of the students must qualify for free or reduced lunch (U.S. Department of Education, n.d.).

The Trailblazer Academy has 81 students, in an unconventional classroom setting that encourages academic, social and emotional growth through innovative teaching. The students in the Trailblazer Academy are also designated by the school as "at-risk not to graduate from high school," and therefore have been registered into this curriculum.

Out of the 81 students in the Trailblazer Academy, a random sample of 15 from the 81 students in the program were chosen to participate in interviews and focus groups. Creswell (2011) states that it is typical within qualitative research to keep participant groups small. Small sample groups allow the researcher to establish relationships with the participants, as well as control over data saturation. "Therefore, a small number of cases (less than 20, say) will facilitate the researcher's close association with the respondents and enhance the validity of fine-grained, in-depth inquiry in naturalistic settings" (Crouch & McKenzie, 2006). Students were pulled from their elective classes to participate in interviews and the focus groups with permission from the principal, elective teacher, and parents. The interviews and focus groups were scheduled by the researcher and teachers so that they did not interfere in classroom instruction.

To establish a positive researcher/participant relationship, the researcher established trust with the principal and Trailblazer teachers by keeping them informed of the study and its process throughout the study. "At all times, researchers should be aware of their responsibility to the communities and societies in which they live and work, and strive to serve the public" (Halej, 2017). Understanding these responsibilities helped the teachers be more at ease, and therefore helped the students establish trust in the researcher and in the process. Participation in this study was strictly voluntary.

The consent form addressed the purpose, methods, and intended use of the study; what methods the participants would partake in; and potential risks and benefits of participation

(Halej, 2017). The consent form also included their right to refuse participation after giving consent and the right to do so without any penalties. The consent form ensured participant confidentiality by using pseudonyms for students, the Trailblazer Academy, the school, and the district. The researcher maintained confidentiality by not revealing the true identities of all participants, including pseudonyms, in the study to any third party.

Sources of Data

The researcher used three sources in order to collect the data needed for this study. "Reality is known through using many tools of research that reflect both deductive (objective) evidence and inductive (subjective) evidence" (Creswell, 2013, p. 37). The first source used for this qualitative study was a questionnaire, which gave the researcher deductive evidence (see Appendix B). The questionnaire was given to all students who returned a consent form. The purpose of the questionnaire was to find how many students in the program did not have home internet access in an objective format. The second source of data was individual interviews (see Appendix C), which gave the researcher inductive evidence for the study. This qualitative data method provided a deeper understanding of student perceptions of their experiences with one-to-one laptop program without having internet access at home. This detailed design intended to uncover any perceived barriers to learning, beliefs, and experiences with technology integration in the classroom as well as at home, and any other questions that arose from the interviews. Finally, the third source of data was the three focus groups, which consisted of the 15 participants from the 81 students in the Trailblazer Academy who also completed the individual interviews (see Appendix D), which gave the researcher more inductive data. "The data from a focus group discussion can help identify themes that tell you the issues that are most pertinent to your problem and help separate the dimensions of a problem" (Wolf, 2017, p. 484). The

narratives from the interviews and focus groups were critical to the data collection for this study since the participants were the only source of data retrieved.

Data Collection

The primary method of data collection for this study began with the home internet questionnaire. This questionnaire determined the number of students in the Trailblazer Academy who did not have home internet in order to determine if there is was digital divide within the program. The data was collected by initially giving the 33 Trailblazer Academy students who turned in a consent form an online home internet survey questionnaire during their math class. The one-on-one interview with the participants was the secondary method of data collection. The purpose of these interviews was to discuss the reasons how not having home internet access affected student learning and achievement. Based on the home internet questionnaire results, 15 students who did not have home internet access were then selected by the random function on Microsoft Excel for an interview by the researcher individually. The final data method was the creation of three focus group sessions with the students who were randomly selected for the interviews. The three focus groups consisting of five students each explored the challenges these students had, and what they felt could be done to resolve any issues.

To conduct the case study, the district and school administration, as well as each student participant and their guardian had to consent to participate in the study. The superintendent of the district, the director of the Trailblazer Academy, and the principal of the school were contacted for approval for this study. All Trailblazer Academy students were required to return a parental permission form and a student consent form before participating in the study.

All data were collected and recorded using a microphone and the voice-to-text feature on a laptop computer, as well as a voice recorder as a back-up method. Using these features allowed

the researcher to have all data immediately transcribed verbatim, significantly limiting any chance for error in data. The students were able to evaluate their responses for accuracy before analysis by the researcher.

The online Home Internet Access Questionnaire was created in Qualtrics and consisted of multiple choice questions (see Appendix B). The questions asked students if they have regular internet access at home, how they access the internet if they do not, and if they used their cell phone service to use as a Wi-Fi hotspot in order to do their assignments at home, which for this study these students were considered among the no internet at home sample. The students were given this questionnaire during class, after approval from the teacher and principal.

From this questionnaire, students were separated into two categories: students with home internet access and students without home internet access. Fifteen students without home internet access were then randomly selected to participate in face-to-face interviews to discuss their experiences and feelings on how not having home internet affects their schoolwork and student achievement. The students were asked nine questions about their experiences with doing homework and other assignments without having regular access to home internet. The questions addressed several issues, including homework completion, project collaboration, and their personal feelings on not having home internet. See Appendix C for questions for the face-to-face interviews for the randomly selected Trailblazer Academy students. There may have been follow up questions not listed here on Appendix C, particularly the short answer questions that may have only generated a yes or no response. According to Yin (2008), interviews can be a reliable source of evidence if they are targeted and insightful; however, the researcher must be careful to watch for biased questions and responses, inaccuracies due to poor recall, and reflexivity where the interviewee gives the researcher answers they think they want to hear.

In addition to the individual interviews, the focus groups gave the researcher an understanding of how the students felt as a whole. According to Creswell (2013), focus groups are a series of small groups that are beneficial to the researcher because the participants can interact with each other and therefore generate more discussion and questions on the subject matter. There were three 40-minute focus groups randomly selected from the 15 students interviewed in the one-to-one sessions. After the analysis of the interview data, the focus group questions were generated from the responses from those one-to-one interviews. Those questions were in direct reflection of the patterns and findings discovered in the interviews after the data analysis.

Identification of Attributes

The researcher used qualitative methods to answer the research question: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

There were three methods used: a questionnaire, individual interviews, and three focus groups. Based on the problem, how do eighth-grade students without home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas, the key attributes of this study were digital divide, information and communication technologies (ICT), and one-to-one instructional technology. The attributes listed assisted the researcher in the creation, development, and deployment of this study.

The digital divide, once only considered lack of information and communication technologies, now includes lack of home internet access. This was important to research because the Armadillo ISD gave each student in grades 7–12 a laptop computer, which closed one digital divide (ICT), without realizing the lack of home internet access among some students would be

an issue, causing a different digital divide (Joan Ganz Cooney, 2015). The use of information and communication technologies in as a learning tool was another attribute the researcher found worth researching pedagogically. One-to-one ICT programs was also important for the researcher since these programs are fairly new to classroom instruction. Instructional technology is the foundation of all ICT programs in schools including computer labs, class sets, and one-to-one initiatives.

Data Analysis Procedures

There are several procedures in data analysis in order to ensure the validity of the data. "Qualitative data analysis involves the identification, examination, and interpretation of patterns and themes in textual data and determines how these patterns and themes help answer the research questions at hand" (NSF, 1997). The researcher analyzed the data generated from participant responses from the interviews and focus groups. All the steps involved data reduction and interpretations by the researcher. The first process after collecting the data is to prepare the data for coding by organizing the data. Coding was completed by dividing the data into groups by questions, participants, and any subtopics. "A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and evocative a tribute for a portion of language-based or visual data" (Saldaña, 2009, p. 3).

The second step was to study the data in order to become familiar with the themes of the data. Throughout this process, the researcher should look for common themes and patterns throughout the data to see possible trends in the subject matter. After locating themes and patterns, categories, and themes were created, the researcher then can code the data. The researcher understands that "coding is the transitional process between data collection and more extensive data analysis" (Saldaña, 2009, p. 4). After coding the data, the next step was to

interpret the data through analytic memos, a series of personal notetaking during the interviews and case studies. During this interpretation, it was also vital to search for alternative understandings. Saldaña (2009) states that the researcher should understand that code does not just reduce data, but it can also summarize and condense it. Finally, the findings from the case study was presented after analyzing and interpreting the data. Data analysis of the questionnaire was collected using Qualtrics in order to divide the responses for both groups of students: those who do have home internet and those who do not. The data from this initial home internet access questionnaire determined the random samples in order to conduct the one-to-one interviews as well as for the focus groups.

Data analysis of the interviews and the focus groups were completed by inductive reasoning, which included gathering the data, coding and finding patterns, and reporting the findings. Once the interviews and focus groups were conducted, all responses were compiled into one Word document. For example, all responses from question one were cut and pasted into a single document, then all the responses from question two were cut and pasted into a single document, and so on until all 10 questions from each participant were together in a single document. The process created 15 transcribed documents for the face-to-face interviews, and three transcripts from the focus groups.

After the gathering of data, the analysis of data began with coding (Yin, 2008). Coding allowed the researcher to analyze the data in order to come to a valid conclusion. The data was reviewed with the literature analyzed in Chapter 2 to determine how the data agreed with the findings in the literature review. The researcher hoped that the findings in the data and literature review gave a better understanding of the research problem and therefore answering the research question (Yin, 2008).

Limitations of the Research Design

Yin (2008) stated that a case study should gather, give, and examine data without prejudice. There are a few limitations to the research design; however, these should not adversely affect the outcome of the study. For example, students waiting for laptop repairs were not used to participate in the online study at the same time as their classmates but were offered an opportunity to answer the questionnaire in the computer lab on their own or the student could use the teacher class set of iPad Minis to complete the questionnaire. Also, enrollment data can change monthly, so there may have been students who did not have a laptop because they were new, and it usually took the student about one week to get a laptop issued to them. These students were excluded from the survey since they would not have experienced the one-to-one program in the district. All the Trailblazer Academy students participated in the initial questionnaire; however, the subgroups within the first group of students helped specify the different experiences of the two student groups. All middle school students in the Trailblazer Academy who returned a consent form received the first questionnaire; however, none were mandated to participate. The students were not rewarded nor reprimanded for not participating.

Validation

To reinforce the qualitative findings, the researcher used several strategies that would increase the finding's credibility and dependability. The three-question questionnaire were given to the participants electronically using Qualtrics. All the interviews and focus groups were recorded and immediately transcribed by using the researcher's laptop, a microphone, and the dictate function on Microsoft Word 2019. The researcher carefully constructed the questions subjectively for the questionnaire, interviews, and focus groups. The subjective questioning format permitted the researcher to get honest answers from the participants without any influence

or perceived bias from the researcher. After interviewing, each student was asked by the researcher to read their transcript in order to verify their answers, as well as to explain anything they felt needed clarification or correction. The review of the transcripts allowed both the researcher and the subject to validate meaning and intent in each transcript.

The electronic transcripts and database created for the study are electronically secure on the researcher's laptop and securely stored in the researcher's locked office. The researcher was the only person on campus who had a key to her office. The laptop was password secured, as were the transcripts and database, which ensured that no one other than the researcher has access to the information obtained in this study. The researcher took great care to digitally lock each document and spreadsheets using these functions on Microsoft Office 2019. The digitally locked database was continuously updated during coding and data analysis as needed to ensure that all the information was current and correct without any bias or influence from the researcher.

Credibility

The credibility of this study was ensured by considering the rigor of the design, examination, and representation at all stages of research. The researcher considered the participants of the study, their perspectives, and those of the future readers of this research to ensure credibility. First, the researcher randomly selected the sample using the random selection mode in Microsoft Excel. Next, the researcher disclosed personal prejudices while continually reflecting upon these prejudices using the researcher's notes. Finally, the researcher addressed opposing views by an analysis of the literature.

Dependability

Dependability addresses the extent to which the research can be repeated in other studies. Because qualitative research generally does not include large numbers of data, it is more

important to ask whether the findings are consistent within the premise of which the data was collected. For this study, the researcher documented procedures for coding data and creating appropriate categories and subcategories. The researcher also reviewed the narratives with each of the participants in order to ensure that the data was accurate and not misinterpreted. Only the researcher knows the true identities of the participants in the study.

Expected Findings

The researcher expected to find that many of the participants in the study would have difficulty in completing homework, projects, and other assignments for school. The researcher believed that the data in the study exposed the difficulties in being in a one-to-one laptop program without daily use of internet access at home. The narratives from the interviews and the focus groups clarified the effectiveness of one-to-one programs for students who did not have internet access.

Ethical Issues

Concordia University–Portland Institutional Review Board (IRB) process. Since human subject research was used for this study, the IRB process required the researcher to get approval to ensure the safety and confidentiality of the subjects were appropriate. This included mandated online research and ethics compliance training, Family Educational Rights and Privacy Act (FERPA), protecting Personal Identification Information (PII), addressing sensitive questions, and conflict of interest.

Conflict of interest assessment. By conducting this study with data, interviews, surveys, there was no conflict of interest, and therefore, objectivity was retained. The researcher did not have a personal relationship with any of the participants in the study. There was also no personal or professional gain for the researcher or any third party from this study.

Researcher's position. The researcher had personal relationships nor financial interests that would cause a conflict of interest for this study. Any professional relationships with the institution was bracketed through use of literature, triangulation of data, and member checking with participants.

Ethical issues in the study. Upon approval from the district superintendent and the Institutional Review Board, consent forms were sent home to all Trailblazer students since all the students in order to participate in the initial questionnaire; however, students were not identified in the study. Instead, the researcher used pseudonyms. Data identification of students were made via the student ID number to maintain their anonymity via the Skyward Data Management System. The original data and derived data sets from district Skyward PEIMS software are stored on their password-protected secured servers.

Chapter 3 Summary

The case study used a qualitative design focusing on a comparative analysis of questionnaires, interviews, and focus groups. Records were divided into two groups based on whether the student had regular access to the internet at home during the school year. The target population were the students who do not have regular access to home internet. Simple random samples were drawn from the target population and used for analysis. From that random sample, students who did not have regular internet access at home were asked if they would like to participate in the face-to-face interview. The same group of random students were then involved in focus groups to discuss their experiences and feelings as a one-to-one laptop student without home internet access. The data was reviewed to determine if the data agreed with the findings in the literature review to determine if students without regular home internet access hurt student achievement based on responses as well as their grades.

Chapter 4: Data Analysis and Results

Introduction

The purpose of this case study was to determine if there was a digital divide among students in a one-to-one ICT program. The research question that guided this study was: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

The sample was eighth-grade students in the Trailblazer Academy (a pseudonym), a program designed for students labeled as at-risk for not graduating high school. Each student in the Trailblazer Academy participated in the Armadillo ISD's (a pseudonym) one-to-one laptop program during the 2018–2019 school year. The findings in this chapter review the data collected from an online questionnaire, 15 one-on-one interviews, and three focus groups.

The students in the Trailblazer Academy participated in the one-to-one laptop program during the previous school year and therefore were familiar in the use of the device. The students were also familiar with many web-based programs and apps (such as Nearpod and Kahoot!) used in the classroom for learning and assessments. Thirty-three students agreed to be a part of the study. The sample size for the interviews consisted of 15 students selected for this study. To protect the confidentiality of the participants, each student in the random sample was given a pseudonym. The three focus groups were then created from the same 15 students interviewed, consisting of five students for each focus group.

Chapter 4 begins with the description of the data sample followed by the data analysis procedure. The chapter also presents the results based on the study's one research question. The students overwhelmingly suggested that not having home internet access negatively affected

their academic achievement. The data analysis consisted of Saldaña's (2009) coding methods in order to find the categories, patterns, and finally, themes of the study.

Description of the Sample

In order to conduct a representation of the perceptions of the sample, the researcher decided to conduct a qualitative research study. A qualitative study allowed the researcher to collect and report on the narratives from the sample in order to answer the research question by using the narratives as data (Berg, 2004). The researcher considered several factors in selecting the sample. The campus was a Title 1 school, and most of the students in the Trailblazer Academy qualified for free or reduced lunch. Since the students in this program were at-risk for not graduating, the students in the Trailblazer Academy used specific instructional software as a supplement to their regular coursework in the program. Since these students used their laptops regularly for their curriculum in this program, they were selected for this study.

There were 81 students in the Trailblazer Academy, which is almost half male students and half female students. The racial demographics showed the majority of students were African American, followed by White, Native American, and Asian-American students respectively. Hispanic students were not counted in the racial demographics but instead were categorized by ethnicity as either a White, African American, or Native American racial distinction.

The State of Texas ethnic demographics for the Trailblazer Academy showed that 40.7% of the students in the program were Hispanic. All students in the sample qualified under the federal income guidelines for free or reduced lunch. The demographic information was retrieved from the Armadillo ISD's Skyward Public Education Information Management System (PEIMS) software (Table 1).

Table 1

Trailblazer Academy Demographics

Pseudonym	Federal Race Description	Hispanic Ethnicity	Sex
Emma	White	Y	F
Gabrielle	Black or African American	N	F
Xavier	Black or African American	N	M
Eric	Black or African American	N	M
Joseph	Black or African American	N	M
Shawn	White	N	M
Sam	White	Y	M
Gary	Black or African American	N	M
Raymond	White	Y	M
Angel	White	Y	M
Jaime	White	Y	M
Nicole	White	Y	F
Dalton	Black or African American	N	M
Blake	Black or African American	N	M
Katherine	Black or African American	N	F

(Flinner, 2018).

Upon consent from the Armadillo ISD superintendent, the researcher discussed the study with the campus principal and the Trailblazer Academy department head. With the permission of the Trailblazer's math teacher, the students whose parents consented completed a short digital questionnaire on Qualtrics during their daily warm-up exercises at the beginning of a class period. Per the suggestion of the principal, the face-to-face interviews were conducted during each student's elective course. The focus groups were organized and held during the participants' advisory class, which coincided with all students' lunchtimes.

To address the research question that guided this study, 33 of the 81 students in the program agreed to participate in the study. Upon receipt of their consent forms, the 33 students took a three-question online questionnaire. The questionnaire asked three questions about home internet use among the students in the Trailblazer Academy; specifically, whether they had home internet access and if they did not, how did they obtain internet (see Appendix B). From the 33

students who took the questionnaire, 15 students who stated that they did not have home internet access were selected for the one-to-one interviews and focus groups using the random purposeful sample. These students were given a pseudonym to protect their identities.

The students were selected for this study by using the random numbers function in an Excel spreadsheet. The selected students were then visited by the researcher to communicate their selection to participate in the interviews and focus groups. The one-to-one interviews were scheduled in advance so the student could prepare for any work they may have missed during their elective course while in the interview. The focus groups were scheduled after all the face-to-face interviews were completed. The focus groups were scheduled during the students' advisory/lunch periods (total of 1 hour). The Friday advisory/lunch period was selected because Friday advisories did not have scheduled benchmark practice, test preparation, or remediation for state assessments as the other days of the week were.

In the individual interviews, the students were asked nine open-ended questions (see Appendix C). The data from the individual interviews were recorded and transcribed electronically, creating 7.5 hours of recorded transcripts for 52 pages of transcripts from the 35-minute interviews.

The focus groups were conducted after the one-on-one interviews were completed. The focus groups were ideal for the sample because the students were familiar with each other, and therefore, would more than likely be open and honest in their responses. The focus group discussions created 2 hours and 25 minutes of transcripts for a total of 24 pages of transcripts. The time to conduct the interviews and focus groups was a total of 9.75 hours, which created 76 double-spaced transcript pages of data. Upon completion of data collection, the researcher

offered students the opportunity to review their transcripts before analyzing the data and publishing the data analysis results.

Research Methodology and Analysis

The research methodology selected for this study is qualitative. The researcher selected the qualitative research methodology for this study to understand the reasons behind the data. Quantitative methods refer to converting data into a numeric form but do not explain how the numbers may have been indicated. "Quality refers to the what, how, when, and where of a thing—its essence and ambiance. Qualitative research thus refers to the meanings, concepts, definition, characteristics, metaphors, symbols, and description of things" (Berg, 2004, p. 3). The researcher wanted to know how not having internet access at home impacted the students in their studies. For this study, it was important for the researcher to obtain the perceptions of the students instead of just obtaining numerical data.

The researcher wanted to know how one-to-one students who do not have home internet access are affected, not just scholastically, but socially as well. The questions in the individual interviews (see Appendix C) were formulated to generate responses from the students to specifically address and answer the research question. The responses derived from the focus group questions (see Appendix D) served to address the similarities and differences of the students' experiences. Responses in the focus groups allowed the researcher to see the interactions between the students when discussing their similarities and differences. The data from the interviews and focus groups gave the researcher the information needed to answer the research question.

A questionnaire, one-on-one interviews, and three focus groups were used to collect data. The questionnaire was given to the Trailblazer students, where 33 of them stated they had no

home internet. Students who did not have home internet but used their cell phones as hot spots were considered students without home internet for this study. These students were considered without home internet because of the limits on data plans on many wireless phone providers, in which many families share data plans.

The questionnaire was a quick way to filter out those who had internet access at home; therefore, students with home internet access were eliminated from the pool of potential participants. The questionnaire also allowed respondents to provide short, clear answers without the threat of misinterpretation (Babbie, 2004). The three-question questionnaire was generated in Qualtrics and administered to the students during their math class (see Appendix B). Students used their district-issued laptops to complete the questionnaire. The questionnaire took approximately 5 minutes for the students to complete, including log-in time.

The 35-minute personal interviews gave each participant a voice about how not having home internet affected their academic achievement. Each participant was interviewed during their elective class so that they did not miss out on core class assignments and lessons. The interviews were held in the researcher's private office, ensuring the privacy of the participants. The participants were asked nine questions about their experiences with the one-to-one program (See Appendix C).

The researcher used the voice recorder on her laptop computer, and the transcripts of the interviews were immediately recorded using the dictate feature in Microsoft Word 2019. These private interviews gave the researcher a personal glimpse of each student's unique experiences from their own words, as well as observing the reactions and body language of the participant. The interviewer made notes on mood, behavior, the demeanor of the interviewee, which were not

included in the direct quotes, however, may have been essential to include in the data (Babbie, 2004).

The focus group discussions were imperative to the researcher's data collection. The three 50-minute focus groups were held in the researcher's office to preserve student confidentiality. The focus groups were held during the students' advisory/lunch period, which allowed the researcher the time needed to obtain the data without feeling rushed. The participants in each focus group were asked five questions about their experiences in the laptop program, specifically how not having internet affected their studies (see Appendix D). The students were able to share their experiences, as well as clarify things the researcher needed from the personal interviews. Interactions between focus group members differed from the interactions between the individual respondent and the interviewer, and therefore, the emphasis was on the group (Berg, 2001).

According to Saldaña (2009), coding serves as a linking system between the data and idea and happens throughout as well as after data collection. The researcher initially reviewed each interview and focus group transcripts for two reasons: to get an understanding of the context and tone of the transcripts. In addition to precoding, the researcher used this as an opportunity to see if the transcripts needed any editing or clarification on words that the voice-to-text feature may have misinterpreted. In these cases, the researcher went back to the subject in order to clarify the word or the meaning of what was said. The researcher wanted to make sure that all the data was ready for coding so that the data could be interpreted as accurately as possible.

The researcher then coded the transcripts digitally using the NVivo qualitative data analysis software. From the coded data, including the researcher's field notes, the researcher

used her judgment for open coding for the discussions from the individual interviews and the focus groups. The individual interviews consisted of nine questions (see Appendix C). The focus groups consisted of 5 members in each group, who were asked the same five questions (See Appendix D).

The researcher used open coding in data analysis for this study. Using open coding allowed the researcher to organize and analyze data into categories for interpretation. After submitting the transcripts into NVivo, the researcher used open coding to determine the positive and negative perceptions of the one-to-one program from both the interviews and the focus groups.

The transcripts from both the individual interviews and the three focus groups were reviewed for item line analysis and initial coding. The data was labeled, and themes were defined to form themes from the codes. Each step of coding involved the data deductions and interpretations by the researcher. The codes that were favorable of the one-to-one laptop program were filed under the positive comments. The codes that indicated negative experiences from the one-to-one laptop program were filed under the negative comments. The initial findings from the coded comments showed patterns in the positive comments if the students were in favor of the experiences of the laptop program. The initial findings from the coded comments also defined the negative perceptions and adverse experiences of their use of the laptop, namely the lack of internet resources at home. After data collection, the researcher organized the data to get it ready for coding by dividing the data by questions, participants, and subgroups. “If it moves, code it” (Richards & Morse, 2012, p. 146). Analysis of the data indicated that there were 257 positive comments and 191 negative comments about being in the one-to-one laptop program.

Summary of the Findings

The researcher initially coded to find positive and negative perceptions of the one-to-one laptop program. The negative and positive codes were separated and then analyzed to find common themes within each group of codes. From the two code categories, the researcher dissected the codes even further to find patterns and themes.

From the themes of the positive perceptions, two categories were discovered: *student buy-in*, *student engagement*. The *student buy-in* category indicated that students in the study overwhelmingly liked and supported the one-to-one laptop program within the Armadillo ISD. The *student engagement* category addressed the ownership and interest the students had in their digital learning. In the *student buy-in* category, two subcategories were found: *ways of learning* and *student-centered learning*. The *ways of learning* category listed the digital methods that students favored in their digital learning methods. Students indicated the ways that they took control of their digital learning achievement, including learning management systems, websites, and social media in the *student-centered learning* category.

From the *student engagement* category, two subcategories emerged: *preferred learning* and *convenience*. The *preferred learning* category included feedback on how students want to learn. The *convenience* category discussed the ease at which student learning has been or could be in a one-to-one learning environment. The *student engagement* category provided data that students in the study described 21st century learning methods that they felt were useful in their overall achievement.

Among the negative perception themes in the data, the negative category *consequences* emerged, which defined what the participants felt their experiences were for not having internet access at home. From the *consequences* category, two subcategories were found: *access* and

impact. The *access* category emerged from the difficulties students in the study had in full participation in digital learning. The *impact* category came from the student feedback on their experiences in digital learning and how it affects their overall student achievement.

Presentation of the Data and Results

This section presents the data of this study, with the results based on the research question that frames the purpose of the study. From the data analysis, the researcher concluded that the research question was answered. This section explains how the themes came from the data and how the data relates to the research question: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas? The four thematic categories that answered the research question were *homework*, *equity*, *future*, and *suggestions*. The thematic categories demonstrate how the students perceive the one-to-one laptop program without having access to the internet at home. Included is a summary of the coding results generated from the data analysis.

All students shared with the researcher that they felt that the laptop program was good for their education, but some negatives were shared as well. For example, some of the students felt that the laptops were used too often for online assessments. Joseph said, "We use the computers for iReady [proficiency assessment software] and stuff to help us with the STAAR test. Sometimes that is all we use them [computers] for." Gary stated that "We have to take these tests online to see what we know and what we need to learn for the STAAR test. It's like that's all we use them for and it's so boring." Another student felt that teachers might not use the computers to their fullest potential. Emma said, "It's like sometimes teachers don't even know what to do with the computers. I would like to do some fun stuff like making pictures, making videos, and

other fun stuff." Overall there were 257 positive comments and 191 negative comments from the initial coding.

There were three themes which stood out from the initial coding: two from the positive list, and one from the negative list. The first theme that emerged from the positive comments were about how the students overwhelmingly support the district's laptop program. The data indicated that some students felt their educational experiences were enhanced when they used the laptops for learning. Gabrielle stated, "I really like that the school gives us laptops to use for school and to take home. I think it helps us all with our schoolwork." Blake shared, "I really like doing work on the computer because I get help with stuff like spell check. I can't get that when I'm writing on a piece of paper." Students such as Gabrielle and Blake liked the convenience the laptops provided.

A few students indicated that they would not have a computer at home to use if it were not for the one provided by the district. Shawn said, "I am glad that I have a computer to use because I wouldn't have one if it weren't for the school giving me one." Raymond stated,

> You know I don't even take a computer class at school this year, so without the computer the school gives me, I would not have a computer at all. I would have to go to the school library to write my papers or to look up stuff on the internet, but only on my lunch period. That ain't [sic] fair for me to have to choose between eating or using the computer.

The data from the positive responses theme led to the first category of *student buy-in* of the laptop program. There were 156 positive comments regarding *student buy-in* in the data.

Next, the data was coded for how students felt about the use of the laptops for their classwork, as well as for homework and special projects. All 15 students expressed an appreciation of the district's one-to-one device for their school assignments in addition to access

to social media and gaming. These data fell under the category of *student engagement*. There were 101 positive comments regarding *student engagement* in the data.

Coding was then conducted to search for patterns within the two positive categories: *student buy-in* and *student engagement*. Within these two categories, subcategories emerged. The subcategories were *ways of learning*, *student-centered learning*, *preferred learning*, and *convenience*. The patterns in the *student buy-in* category found two sub-themes. Sampled students enjoyed using their computers in addition to what they were learning in class. The buy-in included the use of digital textbooks, online ancillaries, as well as using digital learning management software. These patterns dictated the subcategory called *ways of learning.*

Students also indicated they favored how teachers used the student laptops to guide learning as facilitators rather than using traditional methods such as books and worksheets. The ways of learning included grouping students in collaborative teams and using the devices to promote creative thinking and student dialogue. These patterns created the following subcategory *student-centered learning* under the *student buy-in* category.

Finally, the researcher then looked for patterns in the *student engagement* category. Patterns in this category found students enjoyed doing various online assignments, such as writing blogs, creating videos, and creating graphic organizers, to name a few. “I like adding my opinion to discussion questions in Google Classroom,” Eric stated. “Sometimes, I do not like raising my hand in class to answer questions. This way, I still get heard.” These patterns created the subcategory *preferred learning* under the *student engagement* category.

All students liked and appreciated district-provided Wi-Fi for their school and personal use. As part of their digital learning, students felt that even with filters (for Children’s Internet Protection Act [CIPA] compliance), the Wi-Fi still allowed personal uses of sites such as Roblox

(gaming), Instagram and SnapChat (social media), and YouTube (video streaming). Students also appreciated the portability of the laptops. Students agreed the laptops were small and light enough to carry in their backpacks, yet large enough to do their work. They also felt the district gave them enough digital tools to support their learning. Software such as Adobe Photoshop, Stop Motion Studio, and ScreenCast-O-Matic purchased by the district for the students to download are popular among most students in the study. These patterns created the subcategory called *convenience*, which fell under the *student engagement* category.

Along with the two positive categories, one negative category stood out. All 15 students expressed the difficulty of doing homework, research, and projects on the computer without internet access at home. The final category was labeled *consequences* and was more carefully detailed in coding for the researcher to interpret student answers in order to answer the research question.

Although the students had no problem with the school's Wi-Fi network, the lack of internet at home created problems in completing most of their digital assignments. Even though all the students had one thing in common (lack of internet access at home), the reasons were varied. The first subcategory under *consequences* was labeled *access*. There were 77 comments regarding the lack of internet access among the data in *consequences*.

The students were forthcoming in their experiences with trying to do homework and projects without having the internet access needed to complete these tasks. The participants shared their experiences and opinions on how they felt not having the internet at home influenced their grades, their learning, and their overall academic achievement. The researcher summarized this subcategory as *impact* under the *consequences* category. There were 114 comments regarding how students felt not having internet access at home impacted their

learning. After the subcategories were created from the three categories created from the initial coding, the researcher felt well-prepared to proceed to code for *consequences* specifically for the lack of home internet responses, which was sought to answer the research question in this study.

The researcher conducted the second coding by reviewing the negative comments from *consequences* and seeking the references to the explanations students gave for the difficulties of doing their homework on the computer without home internet access. This round of coding uncovered 35 different responses to doing homework without internet access. All 15 students responded with various reasons how difficult it was to do homework without home internet access.

The researcher reviewed the research question along with the categories and subcategories to verify if the research question had been answered. Although the first two categories did not contribute to answering the research question, they did give the researcher the students' point-of-view of the one-to-one laptop program at the Armadillo ISD and their perception of digital learning. The researcher believed that the first two categories also explained how important digital learning was to the sample, and therefore heavily contributed to the responses into the *consequences* category.

The next round of coding sought comments again from the negative perceptions. This coding looked for student recommendations for resolving the issue of doing homework and projects for one-to-one students without home internet access. The students had 29 suggestions and recommendations on how to help students like themselves succeed in their studies. The results from this round of coding came to the theme called *suggestions*.

Finally, a summation of commonly used words and phrases within the transcripts were reviewed for further evaluation. The researcher then did a word frequency query among all the

data from the transcripts. The researcher felt that this would lead to a better understanding of what the needs of the sample were. Figure 3 shows an illustration of the word frequency.

The word frequency search showed that the word *help* appeared 121 times during the interview and focus groups. The word *internet* or *Wi-Fi* appeared 154 times, the word *computer* appeared 112 times, the word *homework* appeared 78 times within the transcripts, the word *technology* appeared 64 times, and the word *hard* or *challenging* about completing digital homework assignments appeared in the transcripts 56 times.

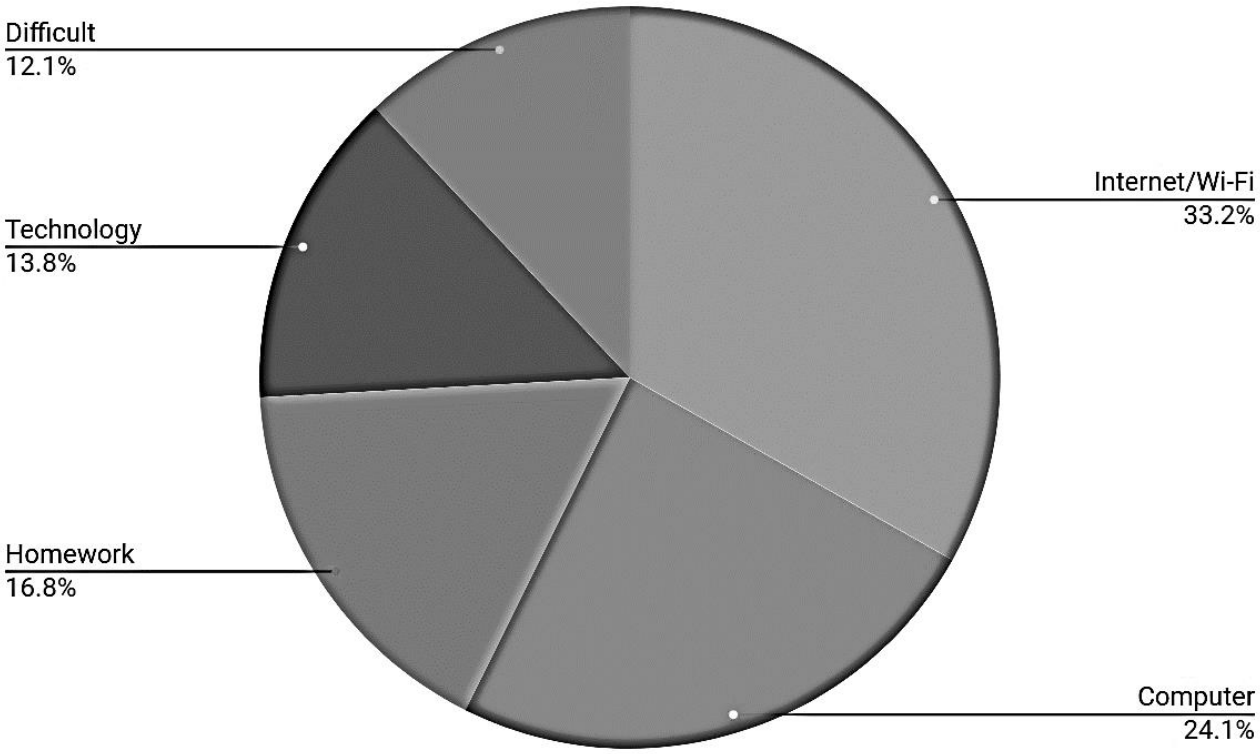

Figure 3. Word frequency in data. Delete this graphic it does not add anything to the narrative

The final step in coding was an overall evaluation of the data in order to interpret if the data from the individual interviews and the focus groups supported and answered the research question. All the reports were reviewed, analyzed, and organized using the researcher's judgment

and understanding of the data presented. A summarization of the data, based on the themes, categories, and subcategories, helped the researcher find the thematic categories in this study. From the *consequences* data, four thematic categories were found: *homework, equity, future*, and *suggestions*. Using the researcher's experience with instructional technology as well as pedagogy, the researcher found strong evidence the data answered the research question in this study. An explanation of these findings is detailed in the next section.

The results of the data present the themes and patterns found from the responses of the questions from both the individual interviews and the focus group discussions. Direct quotes from the sample support the findings in this study, which will guide in answering the research question: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

Homework. The first thematic category that developed from the consequences category was homework, which was established from the impact list. All the students in the sample reported that not having home internet is detrimental for completing their homework assignments. There were 67 references within the data which supports this theme. The students overwhelmingly spoke out about the difficulty they have when trying to complete their homework, which also included studying for exams and projects.

When asked how not having regular access to home internet affected their studies, most of the students stated that not having home internet access made it difficult to ask questions or to check if their answers were correct. Gabrielle stated that "Sometimes my mama ain't [sic] home to help me with my homework, so I can't ask her to help me." Dalton shared that sometimes he must help his siblings with their homework, and sometimes he forgets some steps in math, so he would feel better if he had access to sites like Khan Academy at home in order to make sure he is

correct. “My granny don’t come home until about eight at night [from work], so I have to help my little sisters with they[sic] homework.” Students such as Dalton have siblings to take care of after school.

Students were asked to rate their difficulty in completing online homework without internet access on a scale from 1 to 10, and the average difficulty rating for the sample was 7.8. Gary, who gave his difficulty rating a 9, stated,

> When I have homework that I have to do online, it makes it really hard for me to do it at home since I ain’t got it [internet] at home. I can’t really tell my teacher that I can’t do the homework because they might think that I am lying just to get out of doing it. To tell you the truth, I would rather do all of my homework online. Homework papers get wrinkled and lost sometimes in my backpack. My writing is bad too, so if I can type it, then the teacher don’t have a hard time reading it.

Angel stated that although it is hard to do his homework, he has found ways of getting it done.

> I can get pretty creative when doing my homework online. If I have homework, I try to do it in class when we ain’t doing nothing or in my advisory class. This works because then I don’t have to do it when I get home. If I can’t do it during class, then I try to do it after school when I am waiting for my mama to pick me up from school. Did you know you can get the school’s Wi-Fi outside of the building? The signal is pretty good too. Most of the time, I can get it all done before Mama comes.

Equity. The second thematic category that came from the research question was equity, which came from the consequences category. There were 51 references within the data regarding equity. Equity describes the students’ perceptions that their learning is impaired by not having home internet, and therefore, they feel that they are not getting equal opportunities in their school

achievement. All the students in the sample felt that students who have internet access at home are at a sizable advantage over those who do not. In his interview, Joseph shared with the researcher that he had a project to turn in for a class that he had to do using poster board.

> I did a good job on it, and I got a good grade, but when I saw the ones that the other kids did on the computer, [using Microsoft PowerPoint from Office 365, a web-based program] they just looked better. It made me feel real bad because I can do stuff like that, but only at school.

Another student shared a similar experience. Blake stated,

> A teacher asked us to use a web site to make a funny meme to show that we understood the lesson. That sounded like fun, but I had to do my homework during lunch because I could not go to the website at home on my computer. I was able to do it, but I had to miss lunch with my friends to do it. You know teachers don't ask us if we have internet at home, they just think we all do.

Emma shared a similar experience with the researcher.

> One time my friend wanted to come over to my house to study for a test to help each other. We got stuck on something, and she told me to look it up on my computer. I was too embarrassed to tell her I ain't got no internet, so I told her the computer lady at school was fixing my computer. My friend believed me, so she got on her phone, and we Googled it.

Future. The third thematic category named future came from the subcategory access, derived from the consequences category. There were 43 references within the data regarding consequences. In consequences, the students in the sample expressed their concerns about how

not having home internet access affects their learning now, and how it may hinder their learning as they begin high school in the next school year.

The positive perceptions of the data indicated that the students in the sample had an understanding that digital learning is essential for college and career readiness. This understanding led to the reality that not having home internet access may make things difficult for students, mainly since they must pass the English 1, Algebra 1, and Biology State of Texas Assessments of Academic Readiness (STAAR) assessments in the ninth grade.

Suggestions. The fourth and final thematic category was developed about the research question was labeled *suggestions*. This thematic category came from the negative perceptions in the *consequences* category. This category pertained to the sample's suggestions on how teachers and parents can help students who do not have internet access in order to improve their digital learning experiences.

There were 34 references within the data regarding *suggestions*. Most of the data for this thematic category were collected from the three focus groups, where the students shared their ideas and recommendations of how they get their homework done successfully without using the internet at home. Other suggestions were regarding how to provide internet for students who do not have it. All 15 students gave suggestions for future students and their internet needs at home.

Within the *suggestions* category, two subcategories were discovered by the researcher. The first one was *alternatives*, where students found inventive ways to get their digital work completed successfully. There were 23 references within the data which supports this subcategory. Xavier stated, "Some teachers put the handouts as PDFs, so I am able to download it on my computer then keep the browser window open, so I can see the book when I get home.

After I do that, I don't need the internet to access my work." Xavier stated because of his alternatives, he does not think that others know that he does not have internet at home.

The second subcategory was *proposals,* where students made recommendations for the district administrators and teachers to help students like themselves. There were 19 references within the data which defines this subcategory. For example, Jaime stated, "I live in an apartment building where a lot of my friends from school live. I think if there was a way to have some Wi-Fi by the office or by the basketball court, then we all could share the Wi-Fi and get our work done." Jaime believed that shared Wi-Fi would not only help him but help other students as well.

The researcher discovered during the process of coding *suggestions*, students, had felt that they did not have a voice in telling the adults in their lives what their educational needs were. Eric stated within a focus group, "No one ever asked me how I felt about not having internet before today, Miss." The other four in that focus group nodded their heads in agreement.

Many of the students stated that they did not know whom they could talk to about not having the internet at home. They did not know who could help them with internet access. Angel said, "I didn't want to talk to Daddy about it because he has enough to worry about. My teachers can't give me internet, so who can?" Angel accepted that he just would not have internet at home and would do his best to finish his digital homework without it.

Thematic Category 1: Homework. The first thematic category developed in answering the research question was labeled homework. This category explained how students felt about doing their digital homework, projects, and studies without having home internet access. When asked, "What obstacles have you encountered if you were unable to complete your homework because you did not have access to the internet at home?" (Interview question 7),

most of the students agreed that there were several obstacles in completing homework assignments.

Nicole stated that "Sometimes I have to look up something, like a word, in order to understand something in my homework. I ain't [sic] got a dictionary as we do at school. Sometimes I ask my mom, but it would be nice if I could just look it up on my computer." Another student felt that sometimes teachers assign homework with the assumption that all students have internet access at home. "I got a phone, but it don't got [sic] a plan. I use Wi-Fi on it at school so I can text my friends and use the internet," Gary said. "but that phone ain't [sic] any good to me once I get it home since I got no [sic] Wi-Fi there."

The students shared similar stories in the focus groups. After the group shared homework stories with the researcher, Raymond summarized the issue for Focus Group 2:

> The truth is that we all have to do our homework, but sometimes we can't just do it at home. I gotta [sic] try to stay late after school in a teacher's room for me to do some work. Sometimes I come to school early just so I have some time to get it done. I even got to do my homework in other teacher's classes, and that's hard sometimes because we got work in there to do. This makes it easy for me and probably all of us to get behind in our homework and classwork cuz [sic] we can't always do it at home.

Homework completion difficulties was mentioned by every student in the interviews as well as the three focus groups.

Thematic Category 2: Equity. The second thematic category developed in answering the research question was labeled *equity*. This category explained how students felt how not having home internet access for school affected their learning, and how learning at home is different for them than those who do have home internet access. The students felt passionate

about equity because, as Shawn stated, “We just want what everyone does, to do good in school, make good grades, and go to college.” Shawn said that it was only fair that all students have the same access.

Katherine explained how she feels that having a school-issued laptop can look deceiving to those on the outside. She stated,

> I wish that the people who thought about giving us laptops for our schoolwork also thought about offering us internet too. Teachers think that if I have a laptop, then I have everything I need to get my work done at home. Sometimes I can use my cell phone for a hot spot, and that helps sometimes. Sometimes my cell service gets shut down, and I gotta [sic] wait for my mama to pay the bill. Sometimes she don’t have the money right away, so I have to wait. When I have to wait, it makes it hard for me to do my homework online. I can’t really tell my teachers that I sometimes have internet. They might think I’m lying, and so I don’t say anything to them about it. I don’t want them to think that I have excuses, or I don’t want them to think that I’m poor. That’s so embarrassing, so I keep it to myself.

Two students from two different focus groups shared their similar views on fairness in their learning. Sam stated,

> A teacher sometimes asks us to watch some videos and to write on the discussion board about what we thought about it for our homework. I can’t do that on my computer at home, so sometimes I ask my mama if I can do that on her phone. It’s harder to do that on the phone sometimes because you can’t see real good on it and you can make some mistakes if you aren’t careful. Teachers be [sic] grading on spelling, and sometimes I

misspell things because I can't really see it. I have to hurry up too because Mama want [sic] her phone back fast.

Xavier talked about the social aspect of being without internet at home as well. He stated,

> Sometimes I feel dumb because the other kids (with internet) can do some really cool things with their computers. Some kids get to make videos and put them on YouTube and then turn it in. I can do stuff like that too, but not at home. I ain't [sic] got time to do it in school. I can't do video games or watch videos at home online. Then my friends talk about stuff they saw on the internet, and I can't talk about it because I did not see it. I sometimes pretend that I understand what they talk about, so I don't get left out. It ain't [sic] fun being left out of a conversation when your friends seem to know what's going on, but you don't.

The most pertinent data for this study came from the focus group discussions from question 3: What do you wish your teachers and principals knew about not having the internet at home? The focus groups were forthcoming with their feelings on equity about online homework assignments. All three focus groups shared their concerns about how they feel their digital learning experiences were inadequate because of their lack of internet at home.

Students in the first focus group began answering the question specifically about what they wish their teachers knew about not having internet access at home, however, the conversation quickly turned to fairness in their digital learning experiences. Emma stated, "I feel like the kids who have the internet at home know more stuff than I do." When the researcher asked Emma to clarify her statement, she reiterated, "My friends talk about stuff they found on the internet and shared with each other. I can't see that stuff at home, so I feel left out." Emma felt socially awkward because of her lack of home internet.

Gabrielle said, “I like having a computer to take home, but I wish I could do more with it. I can write a paper and play some solitaire because I don’t need internet to do that, but I can’t watch YouTube or nothing to help me with homework.” Eric agreed and said, “It’s been hard to do some of my assignments. When I get stuck on a problem, sometimes there’s no one to help me out. It would be nice to be able to go online and search for help.” These students had no other way of accessing help or researching information to assist them in their studies.

The second focus group shared similar concerns about equity in their digital learning experiences. Shawn shared with the group that his access to the internet is sporadic. His parents are divorced, but he lives with his mother, who does not have home internet access. “If I had internet all the time at home, then my grades would be better. When I go to Daddy’s house, he’s got internet, but I only see him every other weekend, and he lives on the other side of town.” Gary shared both his frustration and empathy when it came to his lack of home internet.

> Sometimes I get so mad for not having Wi-Fi at home because I know how great it is for me to use at school. The hard drive on my computer died. I saved my essay to the computer instead of on the cloud, so I lost my essay and had to start over. I was so mad, but I can’t blame Mama. It ain’t [sic] her fault, and I didn’t wanna [sic] make her feel bad, so I didn’t tell her.
>
> Self-checking homework is another issue that students were concerned with. Angel stated, “If I could go online at home, I can make sure my work is right. Right now, I have to wait until the next day when my teacher goes over the work.”

The third focus group shared the sentiments of the first two focus groups, but also mentioned the isolation they feel. Joseph stated, “Sometimes I think I’m the only one with this [not having home internet access] problem.” Jaime added, “The internet is something people take

for granted. Not everyone has it." Raymond concluded, "When I can use the internet to do my work, I feel like I am a part of the class." All five students in this focus group agreed with Raymond.

Thematic Category 3: Future. The third thematic category developed in answering the research question was labeled *future*. This category explained how students in the sample felt about continuing their education in high school if they did not have home internet access. All 15 students stated that they wanted to go to college after high school, and from the data in the positive categories, the students understand the importance of instructional technology in their education. In his interview, Jaime stated his concerns for his educational future, understanding the challenges he faces in the future. He said,

> My parents didn't finish high school because Mommy had me when she was 17, and Dad worked and quit school to take care of me and Mommy. They both want me to graduate from high school and go to college. They don't want me to struggle like they do. My cousins, who are older than me, have all dropped out of school. I don't want to be like them. They sometimes make fun of me because I try to do good in school. I just ignore them, but sometimes school is hard, and I want to quit, then I remember my parents and the promise I made to them to try to do good and graduate.

Gabrielle stated that she sometimes does not feel supported in her education at home, even though her father expects her to do well in school. She said,

> Papa doesn't understand that I need the internet to do my schoolwork. He thinks that just because he graduated high school without a computer that I should be able to too. He don't understand that things have changed since he was in school. He just thinks that if he gets internet in the house, then I will goof off and never get my homework done. He

> don't even like that I have a computer at school to use because he thinks I am doing something wrong on it. I wish he didn't think like that, but I don't even have a cell phone because he thinks I'm gonna [sic] do bad things on it. He just don't understand it.

The three focus groups had concerns about beginning high school without having internet access at home. Their Trailblazer teachers have emphasized college and in turn, discuss the importance of doing well in high school in order to get accepted into colleges. Blake discussed that he felt that being behind technologically at home hinders his achievement in school. He said, "It's hard to think that something as common as the internet could hurt my schoolwork, but it does. I worry about high school and wonder if it's going to get better, but I think it will get harder." Katherine added, "We keep getting tested to see if we can pass our STAAR test, and we use computers at school to help with that. I think I could work on iReady (test preparedness software) at home then I could really do good on the STAAR." This focus group agreed that they not only worried about their current grades, but their future grades as they prepare for the ninth grade.

Thematic Category 4: Suggestions. The final thematic category developed in answering the research question was labeled *suggestions*. This category became the voice of the students in the sample as to how to help students like them who do not have regular home internet access. The focus groups shared with the researcher that they had different methods of doing their digital homework without having the internet at home. Joseph stated, "I sometimes go to my friend's house to use their internet. We will work on homework together, and he gives me his password for his Wi-Fi." Other students stated that they sometimes visit local businesses to use their free Wi-Fi. Nicole shared, "My mom likes to go to Chic Fil'A on Family Night, so my brother and sisters can play in the playground there. I bring my laptop with me and Mom, and I work on my

homework together. It's nice because my siblings aren't bothering us." Nicole valued this time to use the internet since she could only access it there once a week.

Other students have found more creative ways to complete their digital homework. Angel said,

> I learned to take screenshots of my screens when a teacher gives me homework online. Then I can go home and see what the homework is and do it on (Microsoft) Word on my computer. When I go back to school, I can copy and paste my work online, and it's all done. It is really easy to do it that way, and no one knows I don't got internet at home.

Dalton shared a similar experience. He stated,

> Did you know if that you put your computer to sleep and not close any windows that you can see the websites you used at school? That's what I do. Don't X out of the screen and then when you get home, you can see everything you need. It even works for videos sometimes. If I can download videos and pages, I do that too. It makes it a lot easier to do my work that way.

Some students felt that administrators should have considered the internet needs of the students before giving students access to one-to-one devices. Raymond stated, "I think they just thought that everyone has internet at home." Shawn said, "I think if they give us laptops, then they should also give us the internet to use too." All students agreed that if the district provided computers to all secondary students in the district, then they should also provide some type of internet access to the same students.

Emma shared her opinion on how she thinks the district should proceed with the future of the one-to-one program for all students. She stated,

> You would think that they would think of the internet just like they do other things they give us. Teachers always got [sic] extra pens, pencils, and paper. They make sure we got books and handouts, and now they make sure we got computers too. Why didn't no one think that we would need the internet too? That is now just as important as having other stuff for school.

Chapter 4 Summary

Four major thematic categories emerged in response to the data collection and analysis procedure found four thematic categories within the data: *homework*, *equity*, *future*, and *suggestions*. The results indicated that all participants had trouble in completing online homework and projects, as indicated in Thematic Category 1, *homework*. This category pertained to the sample's suggestions on how teachers and parents can help students who do not have internet access in order to improve their digital learning experiences. All of the students found that digital homework completion and completing project-based learning modalities were difficult without home internet access.

All students in the study discussed how they feel their educational experiences were not equal to those who have regular access to home internet, as indicated in Thematic Category 2, *equity*. The students felt that their learning is impaired by not having home internet, and therefore, they felt that their educational opportunities are not the same as their counterparts. The sample also gave insights into what they wish their teachers knew about their experiences of doing digital homework without home internet access.

The results also indicated that many participants perceived trouble in their future studies if they continued to be without regular access to the internet at home. These responses are indicated in Thematic Category 3, *future*. The students in the sample population expressed

their concerns about how not having home internet access affects their learning now, and how it may hinder their learning as they begin high school in the fall.

Finally, the participants gave recommendations on how to help students in a one-to-one program without internet access at home in Thematic Category 4, *suggestions*. This category relates to the sample's recommendations on how teachers and parents can help students who do not have internet access in order to improve their digital learning experiences. The students were able to voice their opinions on how to help students like themselves who do not have internet access at home. From the four thematic categories *homework, equity, future,* and *suggestions,* and the data that complemented these thematic categories, the researcher determined that they did answer the research question.

Chapter 5: Discussion and Conclusion

Introduction

In the last decade, school districts have embraced one-to-one information and communications technologies (ICT). One of the factors in these programs is to help bridge the digital divide so that all students would have access to instructional technology (Zilka, 2016). By allowing students to take home the device after school, on weekends, and during holidays, school districts felt that this gave all students equal access to digital learning (Herold, 2018). Although one-to-one ICT programs give each student technology access, there are limits for one-to-one students who do not have home internet access.

According to the literature review in Chapter 2, few studies have explored the lack of home internet access for students in one-to-one ICT programs. The purpose of this qualitative case study was to find out how students without home internet felt about being in a one-to-one laptop program. The researcher sought to answer the research question: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

Since the research is limited on this subject, this study is essential to the field of education as it gives direction to how these perceptions could guide and inform future decisions in future one-to-one instructional technology programs. The conclusions in this study contribute to building an understanding between students without home internet access, teachers, and district administration, including educational technology professionals. The results of this study address the ongoing need for instructional technology access for all students at all levels.

This qualitative case study collected data from a questionnaire, individual interviews, and three focus groups of eighth-grade students from the Trailblazer Academy at Armadillo Middle School for at least two years. The sample size for the individual interviews consisted of 15 participants. For the focus group discussions, each focus group consisted of five students.

In the analysis of data, the researcher utilized the open coding process. The open coding process was managed using NVivo data analysis software. Using open coding methods helped the researcher organize and label patterns, categories, and themes from the data.

From the initial coding, the positive and negative perceptions were coded as parent codes. This analysis technique allowed the researcher to determine the emerging subcategories and themes that are consistent to answering the research question in this study: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

These themes are presented in this chapter within the framework of the existing and known literature about situated learning and the digital divide as well as from student feedback. The researcher reveals the findings from the interviews and focus groups to the current digital learning practices within a one-to-one information and communications technology (ICT) program and the recommendations that could improve instructional technology practices for all students.

Chapter 5 presents the findings of the study about the digital divide among students from low SES backgrounds, and how students who do not have internet access at home who are in one-to-one laptop programs are affected. The limitations and future implications of this

study are also discussed. A discussion of the recommendations for future research concludes this chapter which answers the research question: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?

Summary of the Results

Studies show that there continues to be a digital divide among students (Zhang et al., 2015) but Kivunja (2014) warns that students who do not have ICT and internet access at home may suffer in their educational pursuits. The researcher limited the focus on this study to eighth-grade students in a program of choice at one Title I middle school in Texas. Doing so allowed the researcher to focus on the specific instructional technology needs of the students in this program. In this study, the researcher explored the perceptions of students regarding the district's one-to-one laptop program and its relationship to their primary educational and instructional technology needs.

The goal of this study was to find out how students in a one-to-one laptop program felt about their educational experiences without home internet access. The study helped the researcher understand the instructional technology needs of these secondary students. The narratives from the sample indicated what changes could be made by administrators and teachers so that one-to-one instructional technology programs can benefit all students.

The results of this study provided the researcher with insight into the student perceptions of a one-to-one program without having internet access at home. From the data, the researcher unveiled the benefits of having internet access for these students, as well as the needs of internet access for all students in a one-to-one ICT environment. The researcher found that the technological and educational needs of the students in the sample indicated that the Lave and

Wenger's (1991) situated learning is vital for the contemporary educational culture for these learners as it pertains to 21st century learning models; "for authentic learning to occur, particularly in online environments, elements of situated learning can foster the application of knowledge and skills within real-life contexts" (Smith, Kahlke, & Judd, 2018, p. 512). Students will thrive if given the opportunity to experience situated learning in a one-to-one ICT program.

From the data, the researcher concluded that students in a one-to-one ICT program who do not have internet access at home do not experience the legitimate peripheral participation, authentic knowledge contexts, and community of practice in their digital learning. Therefore, the same students do not experience authentic learning that occurs in digital situated learning practices. This lack of experience can be detrimental to the formal learning of students, especially if they are already behind academically.

Discussion of the Results

Four thematic categories emerged through the coding. These categories gave insight into the research question: How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas? The four thematic categories are described in the following sections.

Thematic category 1: Homework. According to Anderson and Perrin (2015), one of the major contributors to 'the homework gap' is the lack of technology resources at home. Access to home internet can impact active learning and promote critical thinking skills only by practicing what was learned in the classroom (Anderson & Perrin, 2017). Based on the data presented, participants perceived that doing online homework at home without internet access was challenging. One hundred percent of participants in the sample described ways that their digital learning had been hindered for not having regular internet access at home.

Of the 191 negative perceptions coded, there were 67 references to the difficulties the students had in doing online homework. *Homework* was the most common negative perception coded throughout the data. When asked to name obstacles with completing digital homework, participants listed effective teaching practices such as checking to see if homework is correct, online tutoring activities, and collaboration with classmates or teachers.

All participants in both interviews and focus groups shared negative reactions to doing digital homework without home internet access. The sample described specific ways on how not having access to home internet impacted their homework completion negatively. According to Horrigan (2015), teachers are assigning more digital homework in efforts to help prepare students for a digital workforce—7 out of 10 teachers doing so. "Low-income students are at a disadvantage without online access in order to do schoolwork these days" (Horrigan, 2015). Without home internet access, the consistency in the participation, including in homework completion, by all students is lost.

Thematic category 2: Equity. According to Washington (2015), the digital divide is prevalent in African American and Hispanic families, particularly those who are low-income, migrant, and immigrants. The second most frequent theme coded was *equity*, which had 51 references in the data. This thematic category was developed under the harmful perceptions of parent code.

Based on the data, participants perceived that the lack of internet at home put them at an unfair disadvantage over their classmates who do have access to the internet at home. All students in the target sample group shared with the researcher the frustrations they had over having a portion of the instructional technology they need to complete their schoolwork at home.

"When it comes to their ability to use technology, lower-income Americans are more than twice as likely as those in other income groups to be classified as digitally unprepared" (Anderson, 2017). All explicitly stated that they were grateful for the Armadillo ISD (a pseudonym) to provide them laptop computers, but also felt that they could not take full advantage of the use of the device without home internet access, and therefore feel unprepared.

Thematic category 3: Future. The perceived positive influence of the use of instructional technology by students dramatically impacts the future educational and professional careers of the users (Rogers, 2016). A theme was coded related to the perceived fears and concerns that students had about entering high school in the next school year and how not having internet access at home may hinder their learning and academic achievement. This thematic category was developed under the parent code negative perceptions, which had 43 references in the data.

The findings indicated that the students were skeptical of their abilities to complete homework assignments, project-based learning tasks, research, and essays as they approach their high school years if they continued to be without internet access at home. When asked focus group question 5: As you go on to high school next year, how do you think not having internet at home will affect your schoolwork?, all participants shared negative responses and expressed their anxieties toward their academic readiness during their freshman year, a year in which ninth graders begin to take exit state assessments. There are five required State of Texas Academic Assessment of Readiness (STARR) taken in high school; three of those assessments are taken in their freshman year.

Another area of concern addressed in the focus groups was the higher level of work required when they become freshmen at Armadillo High School. Further, knowing their

schoolwork will be more rigorous, they worry about being even further behind than their counterparts who have internet access at home than they are now digitally. According to Anderson (2017), being behind digitally can be damaging to students who are preparing for high school and college readiness, but who do not have access to home internet.

Students will have to collaborate in projects and group work, but the students without internet access are limited to working with others digitally only during class. “Instructional models influenced by social constructivist perspectives highlight the importance of collaboration among learners and practitioners in educational environments” (Couros & Hildebrandt, 2016; Lave & Wenger, 1991). Without collaboration, students may be behind in their communication skills after their formal training into their future educational goals and careers.

Thematic category 4: Suggestions. Despite the negative experiences from the students in this study, many were optimistic and excited about approaching the 9th grade and shared recommendations on how to help students like themselves who need internet access. There were 34 references coded regarding suggestions on future one-to-one instructional technology programs. Based on the data from the focus groups, most students perceived the one-to-one laptop program at Armadillo ISD as a positive experience despite their lack of home internet access. Two subcategories emerged from the data: *alternatives,* where students made suggestions on how teachers could help students complete digital homework without internet; and *proposals*, where students made recommendations for improvements in current and future one-to-one ICT programs.

Under the *alternatives* subcategory, students described ways they were able to get their homework completed without home internet access. There were 23 references to alternatives within the data. Some of the suggestions were to download digital files, such as

handouts, before leaving the campus where they have Wi-Fi. Other students suggested to going to a friend or family members house in order to finish digital homework assignments, while others recommended using free Wi-Fi access points at nearby businesses such as fast food restaurants and coffee shops.

In the *proposals* subcategory within the *suggestions* theme, all students in the study gave recommendations for improving and streamlining the one-to-one laptop program, thus making it equal for all students in the program. Each participant in the study overwhelmingly agreed that if districts are going to provide a laptop or other ICTs to their students in a one-to-one program, that they should also give the students internet access at home as well. The students feel that providing students internet access at home is another tool, like the laptop and software provided by the district, to help all students succeed in their academic pursuits. The students implied the need to be given the same educational opportunities as their counterparts.

Finally, some participants explained that their parents want them to do well in school; however, they are deterred by home internet access because they felt that it is a deterrent rather than a necessity for academic achievement. The students felt that this was important for the district administrators and teachers to understand. The lack of understanding by some parents indicates that there may be a generational gap between some of the students and their parents. Some participants felt that parents must sometimes choose between paying a bill or buying necessities for the household. The internet, in many cases, is considered a luxury rather than a necessary educational tool.

Discussion of the Results in Relationship to the Literature

The researcher collected data and related the findings in the literature review in Chapter 2 on the digital divide and instructional technology practices. The participants in this study shared both positive and negative perceptions and offered suggestions to educational leaders regarding future decisions about instructional technology programs in their schools. From these perceptions, the researcher found four thematic categories in the sample narratives and focus groups. The results in relationship to the literature are explained below.

Homework. Students in a one-to-one program who have internet access at home certainly benefit in the building of the digital literacy skills. Students who gain internet access at home can participate in several forms of homework completion, including using learning management systems, creating digital projects, as well as digital collaboration with classmates. "The learning process in the e-learning environments can be designed in a range of activities in authentic learning contexts" (Kong et al, 2014). This coincides with the situated learning theory (Lave & Wenger, 1995) where knowledge is obtained by students by actively participating in their learning in a collaborative environment.

Another benefit to digital homework for students who gain internet access at home is the time spent on homework completion. Students can take home a laptop with everything they need to complete homework rather than packing a backpack with binders, stacks of books, and reference materials. Time spent on homework could decrease significantly since students can research, revise, and create online (Vigdor, et al. 2017).

Equity. In order to encourage digital equity for all one-to-one students, district leaders need to adapt instructional technologies for all students to benefit from 21st century learning skills. "These individual experiences, shaped very much by the wider social structure of which

they are part, show how young people cannot simply be left to learn digital skills by themselves and that intervention is required to try to address some of the digital inequalities apparent in younger generations" (Enynon & Geniets, 2016, p. 463). In order for a true one-to-one ICT program to work, students must have the same access to all aspects of digital learning. Districts need to be proactive in guaranteeing equitable resources for all students.

Future. Digital readiness for future college, trade school, and career preparation must also be considered vital to the secondary school experience for all students. Horrigan (2016) explained that digital readiness should include digital skills, trust and cybersecurity, and the use of online digital resources. "However, there has recently been a pivot in the technology adoption discussion that looks at people's preparedness, such as their digital skills and their trust in technology, which may influence their use of digital tools, separate and apart from their access to them" (Horrigan, 2016, p. 2). Part of the digital readiness preparation of college and career readiness is that students understand the use and purposes of the digital learning tools given to them by the district. District leaders cannot assume that 'digital natives' understand how instructional technology methods positively influence their student achievement.

Suggestions. To improve one-to-one instructional technology programs to make it inclusive to all students, parents can be an instrumental part of their students' digital learning success. By communicating and educating parents on the uses and advantages of their child's digital learning technologies, districts empower both parents and students in taking charge of their learning experiences. "Although parents have expert knowledge about their children, without support they may have a difficult time creating learning opportunities at home that best fit their children's unique developmental trajectories (Curtiss et al, 2016 pg. 159). District

officials and parents need to listen and understand the needs of their students, and then collaborate in order to help their students thrive in a digital learning environment.

Limitations

The researcher feels that it is important to mention that this study is limited in scope and is not generalizable to other bodies of research. This study took place in a Title I middle school in Texas. The students in the study also had access to their district-issued laptop both inside and outside of the classroom but did not have internet access at home. Additionally, the participants of the study constituted of a homogeneous grouping which was similar in socio-economic status but was also either African American or Hispanic.

This study was also limited, as it did not also explore the perceptions of the teachers or administrators in the school. By discussing these limitations, the researcher suggests future research for further exploration. For example, future research could also explore the possibility of conducting similar research in a rural community. Recommendations for future research are presented based upon student-centered research, student pedagogical needs, as well as 21st century learning methodologies.

Implications of the Results for Practice, Policy, and Theory

In order to address the literature gap, this qualitative case study was designed to explore how students perceived the one-to-one laptop program. The implications of the research are discussed by connecting the research question to the organized themes. The following sections explain the theoretical, practical, and future implications of this study for future research. This section also evaluates the strengths, weaknesses, and reliability of the study.

Practical implications. This qualitative case study encompasses the findings of 15 students without home internet access concerning their perceptions of the Armadillo ISD's one-

to-one laptop program. With the results of the study, the researcher proposed issues that could be addressed using the developing data. Further, the researcher reviewed these issues and found practical recommendations to improve the one-to-one instructional technology standards in K–12 schools. These suggestions are discussed in the following section.

Role of technology directors. It is evident that instructional technology and pedagogy are no longer considered separate entities, instead have merged as the new pedagogical standard (Veletsianos, 2016). School leaders can look for ways to ensure that students are equipped with all the tools needed to make their digital learning experiences positive and more importantly, productive. One way to accomplish this is to survey parents during the school registration process.

During the registration process, parents must approve the district Acceptable Use Policies for instructional technology for their children for the upcoming school year. Registration is the perfect time to survey the parents on technology uses at home. The survey would give technology directors a sense of what technological needs the students in the district have. Once they get this data, they can then proceed with planning for instructional technology programs based on the needs of the students, including home internet access, all while keeping student anonymities intact.

Technology directors should work with the curriculum and instruction department to create additional instructional technology training to cover technological differentiation in their lessons. Results from the home technology survey should be shared with teachers in order to create differentiated digital instruction for all students. For example, some participants perceived the assumption of all teachers that all students have home internet access. Some teachers are not

aware of students' technology needs at home since every student receives a laptop computer from the district.

Finally, parent education and buy-in are essential for one-to-one instructional technology programs to be successful. District leaders should conduct parent training on all aspects of instructional technology, including the use of the device, troubleshooting, best practices, and cybersecurity. Open communication from the district to parents about instructional technology practices and guidelines can only help those parents who are reluctant or who need technical training to help their child succeed in learning.

Policy implications. The research in this study has focused on the experiences of one-to-one ICT students who do not have internet access at home. From the data, it is clear to the researcher that school districts with one-to-one ICT programs should consider the connectivity needs of all students in these programs. This includes providing alternative methods for students to connect to internet, including the purchase of district Wi-Fi towers, G4/G5 devices that automatically connect to district Wi-Fi, as well as portable hotspots for check out in the school libraries.

Districts can also update their policies to include digital integration mandates in their professional development. These technology professional development trainings should be included throughout the school year, and not just during first of the year meetings. It is important for teachers to understand the technological needs of their students and how they complement positive student achievement results.

Strengths and weaknesses. This study focused on current perceptions of eighth-graders in a one Title I middle school in a Texas district. The results of this study may not be representative of all students in the one-to-one laptop program in the Armadillo Independent

School District. The number of participants, as well as the size of the study, was a weakness. Although this was a weakness, the study may provide insight into the needs of students in a one-to-one program who do not have internet access at home.

Despite the weaknesses, the researcher discovered evidence concerning the perceptions of students regarding their experiences in a one-to-one laptop program without home internet access. These strengths can be used to direct educational leaders as they create, continue, and modify current instructional technology practices in their schools. Understanding the perceptions of the participants in this study can develop understandings of student experiences and perceptions of one-to-one laptop programs without home internet access.

Theoretical implications. According to Lave and Wenger's situated learning theory (1991) working within real-life learning situations in the classroom as well as at home can give students the practical experiences they need in order to work with others well beyond their formal learning. Students in a one-to-one ICT program who do not have access to the internet at home cannot fully participate nor be in control of their digital learning. This ties in with the current educational emphasis on college and career readiness in secondary schools.

The theoretical framework also takes into consideration the social aspect of learning, as well. Some participants felt anxious about not having the internet at home since they cannot access their digital materials or correspond with their teachers and classmates outside of the classroom in the same manner as their counterparts. This anxiety is connected to Lave and Wenger's (1991) situated learning, which states that learning takes place through relationships between people and connecting their prior knowledge with authentic contextual learning.

As students who do not have home internet access respond to one-to-one learning difficulties, they must find ways to adapt their learning to incorporate digital requirements

without having the convenience of internet access at home. Some of the issues for the students include not being able to digitally connect with teachers, tutors, and classmates for homework help, tutoring, and collaboration on projects. The coding revealed two leading causes for this anxiety—scores, and the rate or speed of expected learning. This anxiety is directly connected to Thematic Category 1, *homework*, and Thematic Category 2, *equity*.

Some students described their anxiety over how not having home internet access will impact their high school years since they will be freshmen in the next school year. These students described the work that their current teachers are preparing them for high school, particularly English Language Arts and Reading (ELA-R), which is state tested in the ninth grade. They perceived that the digital workload would increase significantly in the next school year.

This qualitative study utilized Lave and Wenger's (1991) situated learning theory and how it applies to digital learning. The situated learning theory provides authentic learning that reflects the way that knowledge will be used for real life (Lave & Wenger, 1991). For measuring the effectiveness of the one-to-one laptop program, the evidence shows all three levels of situated learning for students in this study are negatively affected: legitimate peripheral participation, authentic contexts, and community of practice. Legitimate peripheral participation states that learning comes from culture, activity, and content.

This type of participation introduces students to their learning community as a beginner and gradually increases their expertise as knowledge increases within the community. Therefore, the student goes from being a novice learner into an expert user. The peripheral participation applies to one-to-one digital learners as they all receive the same equipment to do their digital

schoolwork. The peripheral participation decreases for students who do not have home internet access as they cannot participate in the same manner at home as their counterparts do.

Authentic context is learning from incorporating lessons in real life lessons. As school districts encourage college and career readiness in the classroom, these authentic contexts include incorporating digital skills into the students' everyday life. Understanding that digital skills are not limited to schoolwork, students who do not have home internet access cannot practice research or other digital skills that involve the World Wide Web.

The community of practice is learning from socialization and collaboration with others with a similar goal in mind. Socialization and collaboration include digital interaction with other students in project collaboration and educational, social media interaction. Students who do not have home internet access have a difficult time participating in these activities.

Gabrielle said, "My teacher posts to the discussion board after school in Google Classroom and my friends can post stuff back, but I cannot see it until the next day, let alone post something." Consistency is critical when using situated learning in a digital environment "concept of situatedness, is a model of learning in a 'community of practice' that involves users being fully participating in generating meaning" (Altomonte et al., p. 417). Within that community of practice, learning happens through guided participation through activities that help students build knowledge for themselves as well as with others (Fan et al., 2017).

Recommendations for Further Research

In the following section, the researcher recommends studies that scholars in the future could contribute to the subject of student perceptions of one-to-one instructional technology programs without home internet access. This section also summarizes the practical applications

of the results of the study. These recommendations emphasize the importance and conclusion of this study.

Future research could be completed with a larger sample group or sample groups from all the middle schools within a district. Another critical study would compare student perceptions from multiple Title I schools within a metropolitan area within the same study to compare the various one-to-one laptop programs between schools. A comparison study of different grades within a similar program could offer further insight by comparing the perceptions of student experiences throughout different age and grade levels. These studies could help identify commonalities among many students of different grades who do not have home internet access, including students in rural communities where high-speed internet access may be limited.

Future implications. The researcher identified limitations in this study. One limitation was the limit of the sample size, which was composed of one urban Title 1 middle school, and 15 participants randomly selected for the study. As a result, the researcher was able to generate a total of 15 eighth-grade students. This weakness in the sample population may be strengthened in future studies by expanding the location from one middle school to two or three more middle schools. The results may further enhance the findings of this study. Future studies should include a larger sample from different neighborhoods within a metropolitan area. Another future study should also include rural school districts, which Texas has plenty. The researcher suggests future research in Texas could be divided by sports classification populations, i.e. 1A for small school districts and 7A for the largest districts.

The individual interviews were shorter than the researcher anticipated at the request of the principal so that students would not be late for their next class. Although the individual interview times were short for a qualitative study, the researcher felt that the interviews were

thorough enough for this study. The researcher suggests longer interview and focus group times for future studies so that no one feels rushed throughout the process.

The researcher's prejudices and attitudes could bias the data if precautions were not taken. The bias can happen when the researcher interprets the responses from participants in the questionnaire, interviews, and the three focus groups. The researcher intended to remain unbiased throughout the study. By identifying this limitation, the researcher maintained her objectivity to the best of her ability throughout the study. Similar studies in the future by other researchers and in other districts could make the research more objective.

Even with the limitations of this study, the researcher was able to achieve the research purpose and answer the research question of the study. The feedback from the sample in this study was the contributing factors to negative and positive insights. These insights, therefore, may guide future research as well as educational leaders in developing, improving, and continuing one-to-one instructional technology programs throughout school districts across the country.

Recommendations for district technology directors. This study found two categories based on the parent code *positive perceptions: student buy-in* and *student engagement*. The data from these perceptions indicate that the target sample group overwhelmingly favored the one-to-one laptop program offered by the Armadillo ISD. The students felt that instructional technology not only complemented their learning but also felt that it was essential to their academic success. It is recommended that not only should one-to-one ICT programs continue to be used, but they should evolve based on the technology needs of students in the classroom as well as at home.

This study found one category based on the parent code *negative perceptions: consequences* regarding the one-to-one laptop program offered by Armadillo ISD. *Homework*

was the most coded theme in negative perceptions. District technology departments will want to consider how to address the Wi-Fi needs of students who, at best, may have stagnant internet access to complete homework assignments and projects.

The participants in this study noted that it is not enough to give the students devices to use at home but to ensure that they can use them fully. Points to consider in the future could be purchasing ICT devices that run strictly on 4G/5G broadband cellular technology, as cell phones do. An alternative could be purchasing Wi-Fi hotspots for students to check out from the campus library.

Technology directors, as well as curriculum employees, must work diligently to align their expectations of the pedagogical uses of instructional technology. A collaboration of these two departments will best suit all students in a one-to-one ICT device. Not only do these practices need to be updated to keep up with technological advances and curriculum standards, but they also need to be updated to the teachers as well. Teachers need to be made aware of what the collaborative expectations are for the use of ICTs from both the technology and the curriculum departments. The uses also need to be monitored and compared to ensure consistency throughout the district.

Recommendations for teachers. Finally, all the coded themes of this study should be considered by teachers as they create their lessons individually as well as collaboratively in PLC and department planning. The data is categorized into thematic categories: *homework*, *equity*, *future*, and *suggestions* and could help teachers create meaningful digital lessons and experiences for all students.

The first subcategory *homework*, the most common theme from the negative perception thematic category, addressed most of the concerns from the participants. Participants requested

that consideration be given to students who do not have the internet at home. Teachers could have students complete a survey to ask about internet access at their home. A survey will give the teachers advanced notice of the needs of their students, and therefore allowing teachers to modify lessons as needed.

Students also suggested that teachers could offer downloadable and fillable worksheets and documents for students to complete their digital assignments at home without internet access. Further, they requested that the teachers allow time before class for document uploads for homework submission. The students felt that this allowed students without home internet the chance to discreetly submit digital homework without feeling like they must rush as soon as they get to school, and avoiding students being late to class. Finally, participants requested that their digital homework is a true reflection of the assignment that it covers. Students suggested that digital homework should be student-centered, complementing what was learned in class and that the teacher not just uses technology to fulfill a district/campus mandate.

The *equity* subcategory addressed the need for making digital learning accessible for all students, regardless of whether they have home internet access. Participants requested that district administrators and teacher be made more aware of the digital learning of all students in one-to-one ICT programs. The sample group felt that teachers needed effective and consistent digital learning practices so that the students can grow in developing their 21st century learning skills.

Participants also expressed a desire to have teachers communicate with their parents to understand the importance of digital learning and how it applies to their studies, as well as to their college and career readiness. The students believed that doing so would get the parents to buy-in and therefore support the digital learning practices of the classroom.

Finally, the participants felt that the collaboration between the teacher and parents would help strengthen the one-to-one laptop programs because everyone involved would be a willing and active participant in the students' digital learning.

The *future* category represented areas of the students' digital learning and how it may affect their high school academic achievement. The student consensus was that they felt that because they did not have home internet access, that they were somehow behind in not only their lessons but also their technology skills. The participants understand that digital learning is essential but shared their concerns on continuing to feel left behind academically and digitally if they did not have consistent internet access at home. All participants expressed an interest in going to college after high school graduation.

Finally, the *suggestions* theme had two subcategories: *alternatives* and *proposals*. Under the *alternatives* subcategory, students shared with the researcher the different ways that they managed to get their digital homework completed without home internet access. Participants acknowledged that even though they did not have home internet access, that there were ways to get their homework completed.

Some of the students suggested alternative ways students could complete their digital homework, namely opening the school library and the cafeteria before and after school hours to accommodate student Wi-Fi needs. It was also noted that students learned to save documents and web sites to their computers so that they could access them once they got home. Finally, students shared that at times, they could occasionally use a friend or family member's internet access.

The last subcategory, *proposals,* described the desired shifts in the evaluation process. Raymond, an athlete who intends to participate in high school athletics, said that he

would like to get homework done on the bus while traveling for away games, tournaments, and playoffs. Raymond stated, “I think having the internet on the bus could help the athletes to keep up with their homework.” Participants desired more Wi-Fi access points throughout the district, namely on school buses and student common areas.

Students also expressed an interest in how district leaders could be sure that each student could get internet access if they needed it. Some of the student suggestions were to purchase 4G one-to-one devices to guarantee that each student could access the internet from anywhere. Another suggestion was to offer wireless access points for students to check out, like checking out a library book.

There was an expressed desire that leaders consider the digital educational needs of all students, and do not assume that each student has immediate access to the internet at home. Students also requested that their voices be considered in future instructional technology planning for the district. Students felt that they and their parents should be included in the decision-making process to make sure that the district and families share common goals when it comes to digital learning initiatives.

All participants in this study contributed at least one suggestion for district administrators and teachers. These suggestions indicated to the researcher that the participants had an interest in keeping and improving on the one-to-one laptop programs in the Armadillo ISD. Upon reading the suggestions from the participants, the student perceptions from this study should assist administrators and teachers in understanding, and therefore implement the instructional technology changes needed for the students in the district.

Conclusion

This chapter contained a detailed discussion concerning the findings of the study, considering the existing and known literature about eighth-grade perceptions of the one-to-one laptop program without having home internet access. The discussion focused on the contribution of the findings to the literature and in the academic field. It also contained the conclusion of the study and how these conclusions could influence current and future instructional technology programs such as the one in this study. The limitations of the study, the theoretical, practical, and future implications to the practice of instructional technology were discussed along with recommendations for future research.

The sample made recommendations to district administrators and teachers as to how to improve the current one-to-one laptop program. The researcher has concluded that the literature, research, and narratives from the sample in this study indicate a need for equal internet access for all students in one-to-one digital learning environments. The researcher has concluded that the research question: “How do eighth-grade students without regular home internet access perceive the use of a one-to-one laptop program in a Title I middle school in Texas?” has been answered.

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Appendix A: Parental Consent Form

Identification of Investigators & Purpose of Study
Your child is being asked to participate in a research study conducted by Stacey Flinner from Concordia University–Portland. The purpose of this study is to see how students who do not have internet access at home feel about being in a school one-to-one laptop program. This study will contribute to the researcher's completion of her dissertation.

Research Procedures
Should you decide to allow your child to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of a questionnaire, one-to-one interviews, and focus groups that will be administered to individual participants at Armadillo Middle School. Your child will be asked to provide answers to a series of questions related to homework, class projects, and internet access. Students will be audio recorded in one-on-one interviews as well as in the focus groups.

Time Required
Participation in this study will require a total of approximately 50 minutes of your child's time. The initial questionnaire will take five minutes, and it is done via an online questionnaire. The one-on-one interviews will take 15 minutes, and the focus groups will take approximately 30 minutes. The sessions will take place during the students' advisory classes so that students do not miss instructional time.

Risks
The investigator does not perceive more than minimal risks from your child's involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits
There are no direct benefits to the child/parent for participating in this study.

Payment for participation
The participants will not receive compensation or payment for being in the study. If participants will not receive any compensation, state that there is no payment for taking part in the study.

Confidentiality
Your child will be identified in the research records by a code name or number. The researcher retains the right to use and publish non-identifiable data. When the results of this research are published or discussed in conferences, no information will be included that would reveal your child's identity. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents, including audio record, with their answers will be destroyed and/or deleted.

Participation & Withdrawal
Your child's participation is entirely voluntary. He/she is free to choose not to participate. Should you and your child choose to participate, he/she can withdraw at any time without consequences of any kind.

Questions about the Study
If you have questions or concerns during the time of your child's participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:
Stacey J. Flinner
[email redacted]
Concordia University–Portland Doctorate Candidate

Giving of Consent
I have read this consent form, and I understand what is being requested of my child as a participant in this study. I freely consent for my child to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

☐ I give consent for my child to be audio recorded during their interview.____ (parent's initial)

_____

Name of Child (Printed)

_____

Name of Parent/Guardian (Printed)

_____ _____

Name of Parent/Guardian (Signed) Date

_____ _____

Name of Researcher (Signed) Date

Appendix B: Digital Questionnaire (for all sample students)

1. Do you have regular (access every day) internet at home (not including your cell phone)?
    a) Yes
    b) No

2. If yes, how do you receive your internet services? (Do not answer if you answered No for Question 1.)
    a) Through my cable service provider
    b) Wi-Fi router through my cell phone service provider
    c) I am not sure, but I know I have home internet that is not accessed from my smartphone

3. If you do not have regular (every day) internet access at home, where do you get your internet to do your homework? Check all that apply (Do not answer if you answered No for Question 1.)
    a. School
    b. Family member or friend's house
    c. Free Wi-Fi at a local business (i.e., McDonald's)
    d. I use my smartphone as a Wi-Fi hotspot

Appendix C: One-on-One Interview Questions

1. How do you feel about the laptop program in regards to your schoolwork?

2. In what ways does having a laptop computer help you do your schoolwork?

3. How do you think having internet access helps you with your everyday schoolwork?

4. In what ways do you normally get internet access? How often do you access the internet in this/these way(s)?

5. What methods do your teachers use to give you digital homework? (i.e., Google Classroom, Blackboard, Flipped Instruction)

6. Explain how your digital and traditional homework is done without internet access?

7. What obstacles have you encountered if you were unable to complete your homework because you did not have access to the internet at home?

8. Have you let your teachers know that you do not have the internet at home? If so, in what ways have your teachers adjusted your digital homework so that you could complete it?

9. How does not having the internet at home affect your homework grades?

Appendix D: Focus Group Questions

1. What do you like about being in a one-to-one laptop program?

2. What are some of the challenges that you want teachers to know about having a laptop but not having internet?

3. What do you wish your teachers and principals knew about not having the internet at home?

4. How do you think teachers can help you complete your digital homework and projects?

5. As you go on to high school next year, how do you think not having the internet at home will affect your schoolwork?

Appendix E: Statement of Original Work

The Concordia University Doctorate of Education Program is a collaborative community of scholar-practitioners, who seek to transform society by pursuing ethically-informed, rigorously- researched, inquiry-based projects that benefit professional, institutional, and local educational contexts. Each member of the community affirms throughout their program of study, adherence to the principles and standards outlined in the Concordia University Academic Integrity Policy. This policy states the following:

Statement of academic integrity.

As a member of the Concordia University community, I will neither engage in fraudulent or unauthorized behaviors in the presentation and completion of my work, nor will I provide unauthorized assistance to others.

Explanations:

What does "fraudulent" mean?

"Fraudulent" work is any material submitted for evaluation that is falsely or improperly presented as one's own. This includes, but is not limited to texts, graphics and other multi-media files appropriated from any source, including another individual, that are intentionally presented as all or part of a candidate's final work without full and complete documentation.

What is "unauthorized" assistance?

"Unauthorized assistance" refers to any support candidates solicit in the completion of their work, that has not been either explicitly specified as appropriate by the instructor, or any assistance that is understood in the class context as inappropriate. This can include, but is not limited to:

- Use of unauthorized notes or another's work during an online test
- Use of unauthorized notes or personal assistance in an online exam setting
- Inappropriate collaboration in preparation and/or completion of a project
- Unauthorized solicitation of professional resources for the completion of the work.

Statement of Original Work (Continued)

I attest that:

1. I have read, understood, and complied with all aspects of the Concordia University–Portland Academic Integrity Policy during the development and writing of this dissertation.

2. Where information and/or materials from outside sources has been used in the production of this dissertation, all information and/or materials from outside sources has been properly referenced and all permissions required for use of the information and/or materials have been obtained, in accordance with research standards outlined in the *Publication Manual of The American Psychological Association.*

Stacey J. Flinner

June 21, 2019