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One to One Device Initiative Implementation in a Rural High School in Mississippi

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This is to certify that the doctoral dissertation by

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Abstract

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Abstract

One-to-one device initiatives provide access to digital learning for students; however, little is known about how this process occurs in rural schools. Implementing a one-to-one device initiative may have positive effects on student access to digital technologies as well as student and teacher efficacy when sufficient training happens beforehand. The purpose of this qualitative case study was to examine the implementation of a one-to-one laptop initiative in a rural high school in Mississippi, focusing on policy development and stakeholder views. The conceptual framework of implementation science and theoretical frameworks of normalization process theory and adaptive implementation guided the research. The research questions explored factors influencing the process of implementing a one-to-one device initiative in a rural high school and how stakeholder views influenced the decision-making and implementation process. Purposive sampling was used; interviews, focus groups, and document analysis served as the data collection methods. Data from nine participants and related documents were analyzed using Excel and open coding. The resulting themes suggested that teachers' perceptions communicated a lack of self-efficacy related to a diminished role in policy development and training. Teachers reported some students' lack of self-efficacy related to using the devices in the learning setting. Also, administrators acknowledged that teachers and students experienced challenges with the implementation process. Implications for positive social change suggest increased teacher/student involvement in the policy making and implementation process relative to practice and application during the developmental stages of the one-to-one implementation.

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Dedication

This dissertation is dedicated to the memory of Mr. Johnny Lee Oats and Mrs. Freddie Mae Greenlee-Oats who raised me to be productive and confident in the Lord and in myself. They were my grandparents and worked hard to instill in me the value of education, which they referred to as schooling. Posthumously, I dedicate this scholarly work to their continued struggle to mold and shape me into the woman I have become today. Your faith lives in me!

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Chapter 1: Introduction to the Study

Introduction

Many states, such as Mississippi, face the alarming statistics that place them on the at risk list for failed digital education in an era of digital learning (Columbia University, 2014). Public school districts across the nation have implemented one-to-one device usage in the classroom for students and teachers (Harper & Milman, 2016; Lin et al., 2012). Although some public schools have adopted one-to-one initiatives, there is a growing need for a framework for implementation that considers the social dynamics and financial constraints of public schools in rural areas with limited access to digital technologies. More research is needed to understand the policy and planning context relative to implementing a one-to-one initiative (Keane & Keane, 2017). The question raised is how a school implements a sustainable one-to-one initiative in a way that supports best practices in educational technology and academic assessment of content and applied knowledge in the K-12 classrooms, particularly in underresourced rural schools. Better understanding may help with the implementation of technology in ways that positively impact student learning while still being sensitive to local context. In this chapter I include background literature related to the study, present a statement of the problem and purpose of the study, review the research questions and research approach, explain the conceptual framework, and present the scope of the study as well as its assumptions and limitations.

Background

This study examined the process for implementing one-to-one computing devices for students and the methodologies, if any, used to implement these technologies in public rural high schools in Mississippi. This investigation may begin to address a gap in research focused on understanding the issues of a rural high school districts relative to implementation of a one-to-one initiative. Furthermore, it may provide an avenue for understanding the implementation process that can be used as a framework for other rural districts to follow. The results of this study may provide insights for district policy makers, school administrators, and teachers to help them make informed decisions that may increase the productivity of the implementation process of one-to-one devices and possibly other technology initiatives lending support to the positive social well-being of a 21st century school and community.

The one-to-one laptop initiative began its diffusion process in 2001 and has been rapidly implemented in many of the nation's public schools (Goodwin, 2011; Zheng et al., 2016). Despite the cost of such an initiative, the state of Maine implemented a state-wide laptop for every student program in 2006 based on the premise that access to technology for every student may provide more opportunities for learning (Goodwin, 2011; Peterson & Scharber, 2017). Subsequently, other public schools followed to provide more access to educational resources for their students and to reduce the cost of paper and books on a district or school level (Stone, 2017). However, the success of such initiatives may have direct correlation to the processes of the schools that adopt them (Goodwin, 2011; Zheng et al., 2016). Bebell and Kay (2010) investigated five middle

schools in western Massachusetts and found that after 3 years, one of the schools had abandoned their one-to-one initiative. Their students were not using technology at a higher rate than those students who did not have access to the one-to-one computing devices. This attrition (loss of the program) was attributed to the lack of teacher training and buy-in (Peterson & Scharber, 2017). However, other schools experienced some success on a small scale in the writing ability of students with the use of the one-to-one laptop initiative, but this increase was not enough to connect the laptop initiative to an authentic growth in student achievement across all academic tested areas (Goodwin, 2011; Hockly, 2017).

Goodwin (2011) in addition to Peterson and Scharber (2017) revealed some key factors necessary for successful implementation of one-to-one device programs. However, rural schools may not have access or opportunities to address these key factors due to the context and/or culture of these schools. The key factors that Goodwin (2011) mentioned were (a) ensuring that every class experiences uniform integration of these technologies; (b) ensuring that teachers have deliberate, scheduled time for communication and collaboration on a monthly basis, at minimum; and (c) ensuring that students are using technology daily for online collaboration and cooperative learning.

The growth of one-to-one programs has reached many rural areas, such as small towns in Mississippi, where there is little or no access to the Internet for many students outside of the school environment (Bonk, 2010; Power et al., 2020). In fact, according to Census data reported by File and Ryan (2014), Mississippi falls below the national average for homes with computers and digital access to the World Wide Web. The U.S.

Census Bureau (2016) defines a rural area as all territory, housing units, and locales of a town or city that have not been defined as urban. The definition of rural has been consistent in Census Bureau history since 1910. However, the definitions of urban and suburban areas have changed throughout history due to modifications in patterns relative to settlement of areas, data usage, and the technology available to measure urbanized areas. Currently, the U.S. Census Bureau (2016) defines urban based on population density and not location alone. Urbanized areas are defined as having at least 1,000 people per square mile and the areas are unincorporated. On the other hand, the suburban population is part of the incorporated area of townships, and cities benefit more from local tax dollars and have greater access to business and industry (Chambers, 2014).

Rural areas are substantially more underdeveloped and/or under populated than urbanized areas and suburban areas (Chambers, 2014). Due to the dynamics that define the rural, urban, and suburban populaces, public schools that are located in these areas possess certain unique characteristics that limit or provide better access to educational resources. However, the National Center for Educational Statistics (2015) reported that rural public school students perform just as well on standardized tests as students from suburban public schools, there remains an access to technology issue in rural areas when compared to suburban areas (Editorial Projects in Education, 2016). Due to the unique nature of rural school, a process for successful implementation may impact the degree to which digital technologies can be used to effect positive academic growth in the learning and instructional processes.

Problem Statement

Access to digital technologies has been the focus of many federal government and state initiatives in an effort to encourage districts to meet mandated technological benchmarks set by the Common Core Standards of learning (Miller, 2014). Some states have adopted widespread laptop initiatives (Argueta et al., 2011; Stone, 2017). Barker (2017) posited that rural schools have unique needs in that their geographical locations may pose access difficulties to classes that students need or desire to complete their high school education (Barker, 2017). According to Barker (2017), some administrators have employed traveling teachers to address the issue of access to more classes while other administrators have tried to use technology to lessen the access gap. However, Barker (2017) stated having technology for every student on sight would possibly bring the classes needed within reach for each student. A few school districts across Mississippi have implemented a one-to-one initiative to provide access to technology for their students (Columbia University, 2014). However, there is a framework deficiency for the implementation of one-to-one initiatives in rural school settings and there is a growing need for a structure for implementation that considers the social dynamics and financial constraints of public schools in rural areas with limited access to digital technologies (Correa & Pavez, 2016). Research supports the link between technology use and student engagement (Heflin et al., 2017; Lennox-Terrion & Aceti, 2012). Researchers have found that students tend to engage in active learning in an environment where appropriate use of technology supports the learning needs and gaps of students (Cavanaugh & Hargis, 2014; Heflin et al., 2017). One-to-one initiatives are one way to support those needs.

More research is needed to understand the issues and context of implementations of one-to-one initiatives in rural schools. In this educational investigation I sought to provide insights in this area and open a pathway for further research to continue to support educational technology in our nation's secondary public schools focused particularly on the needs of rural schools.

Purpose of the Study

The purpose of this qualitative case study was to examine the implementation of a one-to-one laptop initiative in a rural school with a focus on policy development and stakeholder views. Technology integration is not always tested before implementation, and stakeholders often provide support to technology integration before adequate testing and training is provided to teachers (Berrett et al., 2012; Shepherd & Taylor, 2019). Schools offer quick fixes, such as workshops and seminars, that inadequately meet the training needs of educators involved in the implementation process (Fletcher, 2009; Heath, 2017; Meister, 2010). As a result, one-to-one initiatives may be at an increased risk for unsuccessful implementation from their inception.

Additionally, in this study I sought to provide an in-depth understanding of potentially unique factors affecting implementation of such initiatives in underresourced rural districts. Despite the substantial investments poured into one-to-one computing initiatives by school districts, there remains much to be learned concerning which aspects of program implementation work and which aspects do not work (Heath, 2017; Howard & Rennie, 2013). Findings of this study may add to the present body of knowledge

available to rural schools as they contemplate adopting a one-to-one initiatives in their districts.

Research Questions

The following questions guided the research.

RQ1: How does implementation of a one-to-one initiative occur in a rural school district?

RQ2: What factors influence the implementation process?

RQ3: How do the views of stakeholders' influence decisions in implementing a one-to-one initiative?

Conceptual Framework for the Study

The foundation for this study was the conceptual framework of implementation science. This framework, as defined by the National Institute of Health (NIH), provided a way for developing knowledge that could be generalized across settings and contexts to provide answers to vital questions and used in research to explicate and to broaden the understanding of the specific issues under investigation by the researcher (NIH, 2014). The concept of implementation science was a newly emerging field that had also been used in education to generate more effectual programs and positive outcomes (Cook & Odom, 2013). The intent of implementation science is to explore, investigate, and report major concerns that impede effective implementation (NIH, 2014). An additional goal of implementation science is to create knowledge that can be generalized across settings, disciplines, and contexts (Procter et al., 2011).

The concept of implementation science has been referred to as a conceptual model for practice (Byrk, 2016). LeMahieu (2016) described implementation science as a model for adaptation with its goal to open an avenue that will provide a reliable method for a process to work effectively for varied professionals and organizational contexts. However, a theoretical support is needed as a frame of reference or point of "know how" to drive the conceptual process of implementation science across contexts and disciplines (Nilsen, 2015). Various theories have been used by implementation researchers to understand implementation processes. The most widely used theory that has been described as supporting implementation science has been the normalization process theory (NPT; Nilsen, 2015).

NPT provided a lens by which to further understand implementation strategies. Although I did not use NPT as a theoretical framework or underpinning to the study, I used it as an integral part of the conceptual framework of implementation science to examine the one-to-one device implementation process. The process must take into account implementation fidelity and integrity (depending on the context) during the implementation process. Under the umbrella of implementation science, implementation fidelity embraces the logic of what works in education (Byrk, 2016). It hinges on the premise of explanatory power as its purpose is to control the implementation process. However, implementation integrity says to do what is best for the context while accommodating local needs and circumstances to ensure an effective implementation process (LeMahieu, 2016).

Alternatively, NPT provides a set of tools or a network of strategies to aid in understanding and explaining the implementation process. Implementation science provides a framework to understand what works where and why through five domains: (a) intervention characteristics, (b) outer setting, (c) inner setting, (d) characteristics of the individuals involved, and (e) the process of implementation (Damschroder et al., 2009). The first research question dealt with the actual process of implementation and how it occurred, which was aligned with Domains 1 and 5 of the implementation theory. The second research question was developed to understand the factors that influenced the implementation process and was aligned with Domains 2 and 3. The final research question was about the stakeholders and aligned with Domain 4. NPT and implementation science are discussed further in Chapter 2.

Nature of the Study

The nature of this study was a single instrumental qualitative case study. Qualitative methods are concerned with what is happening, why something happens, and/or how it happens (Yin, 2011). As an instrumental case study of a single rural school, the goal was to gain insights into the process of adoption in one-to-one initiatives in underresourced rural schools. During the qualitative, case-study process, I extracted data using interviews with adult stakeholders and document analyses. Additionally, under the qualitative umbrella, the single instrumental case study approach allowed this investigation to be focused on generating understanding concerning the implementation of one-to-one initiatives in a rural school district that was typical of other rural districts in

the state. The in-depth focus on implementation covered a broad range of contexts and complex conditions (Yin, 2011) and kept the emphasis on the views of stakeholders.

In this study, the stakeholder whose views I sought included school board members, school technology personnel, members of the parent-teacher organization, school administrators, and teachers. I investigated their perspectives relative to what worked for implementation, barriers to implementation, and the impact of the implementation process on instruction. I sent each of these groups, specific to this school, materials to recruit participants to be interviewed. I describe recruitment procedures for these stakeholder groups in detail in Chapter 3. I analyzed the data inductively using common qualitative analysis techniques, beginning with open coding of interview transcripts, notes, and documents. I examined codes and combined them into categories with the goal of developing broad themes that could be looked at in relationship to the literature and conceptual framework.

Definitions

I used the following terms operationally in this study.

Implementation: In the context of this study, the actual practice of a methodology following the stages of research to practice and the social pattern or structure that is used to bring a practice into action (May et al., 2009).

One-to-one device: Any mobile device provided by the school, typically a laptop computer, that becomes a take-home device for each student (Sauers & Scott, 2012).

Policymakers: Persons who make decisions relative to the operation of an educational institution (Rogers, 2003). Specific to this study, policy makers are the school board members of a school district.

Rural: All areas that are not defined as urban or suburban, according to the U.S. Census Bureau. Please refer to the Background of the Study (U.S. Census Bureau, 2016).

Stakeholders: Persons with interest or concern in a specific effort or process (Rogers, 2003). In this study, school board members, school technology personnel, members of the parent-teacher organization, school administrators, and teachers are referred to as stakeholders.

Technology adoption: The acceptance of the use of a specific technology and the integration of the technology into the professional and/or social environment in which it will be used (Teo, 2014).

Assumptions

This study was based on two basic assumptions supported by the literature. Firstly, the literature indicated that underresourced rural public school districts were faced with problems of digital access (access to digital educational programs) for their learners outside of the school environment (File & Ryan, 2014; Power et al., 2020). As a result, some rural districts have supplemented the deficit in digital access by providing access beyond the classroom through the implementation of a one-to-one device program (Columbia University, 2014; Power et al., 2020). Secondly, I assumed that rural schools have unique populations and cultures that contribute to their undergrowth in digital access, thereby fostering a disadvantageous environment to effective implementation of

the one-to-one device initiative across stakeholders. In this study, I assumed that views of

stakeholders can provide a realistic and accurate view into the implementation process

following a policy decision, such as implementing a one-to-one laptop initiative.

Furthermore, for this study I assumed that investigating the implementation process in

this rural school would have transferability to other rural high schools with similar

contexts, holding that documents reviewed were accurate and accurate accounts were

given relative to the one-to-one implementation process.

Scope and Delimitations

In terms of scope, I examined only one rural high school in Mississippi. Only

stakeholders as identified in the definitions above were included among those from whom

I collected information. No students were included as participants. I employed

stakeholder interviews and review of policy related documents during the data collection

process.

Limitations

In terms of limitations, the study was a qualitative single case study and as

researcher, I was the key instrument for data collection, data analysis, and data

interpretation. I identified my personal assumptions and biases during the process of data

collection and data analysis. In an effort to minimize such biases, I consistently

maintained an awareness of the tendency and purposely exercised neutrality throughout

the investigative process by following the fidelity checklist for qualitative research

(Levitt et al., 2017). Furthermore, I kept a reflective journal (for accuracy of reporting

observational data) and used the process of member checking and triangulation to further

minimize biases and strengthen the internal validity of the study (Miles et al., 2014).

The limitations of the study were also relative to the sample methodology. I used

a purposive sample due to the school setting and type of participants needed for the study.

In terms of the setting, this limited the number of participants due to the setting size. In

terms of access to participants, the district had one high school from which to select

participants and the number of available participants were limited to number of

educators, administrators, and school board members associated with the high school in

this rural district. I solicited parents from the school's parent teacher association. I

contacted the president of the parent teacher association through email to request a

meeting to present the study (additional details are in Chapter 3). Relative to the populace

from which the sample was drawn, I disclosed that this was my place of employment.

However, I had no supervisory role and I exercised the strictest level of integrity while

conducting the research to ensure that no data were compromised due to the relationship

that I may have had with the participants.

Additionally, I examined only one rural high school in one state in this study. As

a result, the findings may not generalize to nonrural schools, other high schools, or other

levels of schools such as middle, elementary, or schools in other geographic locations.

Due to the geographical context of this school, the findings may not translate to

geographical areas outside of its context. In addition, some documents may not have

survived over time, important information relative to the implementation process may not

have been recorded and preserved, and the accuracy of the memory of the participants

relative to the implementation process as well as the tendency to portray oneself positively may have contributed to the limitations of this study.

Significance

One-to-one devices have become a key digital resource for many public school districts across the nation (Argueta et al., 2011). The resource deficiency for underresourced rural public school districts poses a threat to narrowing the digital divide for their learners and educators (Columbia University, 2014; Power et al., 2020). In addition to having a deficiency in resources, there was little research that supported an evidence-based methodology or model for implementing a one-to-one device initiative in rural schools, for supporting quality implementation, and for minimizing instructional and policy implementation pitfalls during the implementation phase (Harper & Milman, 2016). In this study I sought to inform that gap and possibly help other underresourced rural schools in their efforts to reduce the digital divide and support learners, thereby improving student learning outcomes and contributing to positive social change. By better understanding the implementation process for one-to-one initiatives in rural schools, it may help other schools move more smoothly through the implementation process and increase access to digital tools for rural school students. Such access may have implications for social change by reducing the digital divide for rural students and enhancing their digital skills, resulting in enhanced college and career readiness.

Summary

In this study I explored the implementation process as a way to inform practice. Additionally, I examined the factors that influenced implementation of one-to-one

devices in rural underresourced school districts. Furthermore, I investigated the barriers

that underresourced school districts face relative to implementation, the influences that

stakeholders have on the implementation process, and how the implementation process

influences the learning environment of the students.

In Chapter 2, I review the literature regarding the process of implementation and

the impact that technology has had on student engagement and teacher pedagogy using

these technologies. I also examine the phases of implementation, the characteristics of

successful implementation, and the barriers that some districts have faced in the wake of

implementation of the one-to-one device initiative. I also examined other studies related

to one-to-one device implementation in schools. A review of the literature seemed to

indicate that there was an apparent gap in the knowledge relative to how rural high

schools have successfully implemented school wide initiatives that involved a laptop

device for every student (Harper & Milman, 2016). Furthermore, I examined the

literature on differences between rural and urban/suburban schools concerning access to

technological resources that may influence adoption .

Chapter 2: Literature Review

Introduction

Multiple studies have been conducted regarding technology and its impact on student learning. Researchers do not dispute the overwhelming findings that students born in the digital age prefer to learn with technological devices such as laptop computers, cellular devices, and tablets such as the iPad or an Android driven tablet device (Penuel, 2006). As a result, public school districts across our nation have implemented a one-to-one device initiative that places a laptop in each student's possession for the duration of the school year. Some of these school districts have implemented the one-to-one device initiative to support student learning for the digital native learner and to aid in narrowing the digital divide for our nation's students (Columbia University, 2014).

However, substantial research was lacking in a methodology for implementing an initiative such as the one-to-one device in rural high schools. Mississippi has been recognized as a rural state by the Center for Social Inclusion (2012), the U.S. Department of Agriculture (2000), and the U.S. Census Bureau (2016), where students have little or no access to digital technologies and little or no access to the World Wide Web. The focus of this literature review was to gather and synthesize current research on implementation of one-to-one devices in schools in general and in rural underresourced public schools specifically as well as review other characteristics of rural schools that differentiate them from other school populaces. Additionally, I used the literature to examine the process that public school districts have used to implement technologies in

classrooms within their schools, including boosters and barriers related to technology integration in schools. I also used this literature review to present information on stakeholder roles in school decision-making and take an in-depth look into the conceptual framework of implementation science as related to this study. The topics covered in this chapter include a review of the literature search strategy, description of the implementation science conceptual framework used in the study, followed by a review of key topics in the literature including implementation of laptop programs in schools, the context of rural schools, and strategies related to technology integration in schools.

Literature Search Strategy

During the research phase, I used keywords such as *mobile learning, mobile technologies, implementation science, rural and under-resourced rural schools in education, one-to-one laptop initiatives in high schools, public school policy and implementation, booster and barriers related to technology implementation and integration,* and *instructional technology in secondary schools*. I also used EBSCOhost (ERIC, Academic Search Premier, SAGE Premier, and LearnTechLib) search engine from Walden University and reviewed books, periodicals, and journals from other libraries. Additionally, I employed Google© Scholar's link to Walden's resources.

The literature research process began with an investigation pertaining to the use of one-to-one laptop technologies in schools in general and specifically in under-resourced schools. I then examined how widespread the one-to-one initiative was in high schools in rural areas and concluded with the implementation process used to integrate laptop technologies into the schools.

Conceptual Framework

Implementation science continues to be an emerging science in the field of research and education. Although the primary goal of implementation science is to develop a systematic yet effective path to practice, its acceptance as a theoretical model has not been widespread in the field of education across similar practices (Byrk, 2016). Consequently, Nilsen (2015) asserted that a theoretical underpinning is needed as a frame of reference or point of "know how" to drive the conceptual process of implementation science across contexts and disciplines. Over the past decade several theories have been used by implementation researchers to understand implementation processes; however, the most widely used theory has been the NPT (Nilsen, 2015). The theoretical base, NPT, provides a rationale for implementation strategies and assists in substantiating evidence-based practices needed to drive the implementation process (May et al., 2009). Therefore, in this study I employed the NPT as a part of the conceptual framework of implementation science relative to the implementation of a one-to-one initiative in a rural high school in Mississippi. After reviewing each of these concepts (implementation science and NPT), I discuss adaptive implementation as a conceptual approach to this study.

Implementation Science

Procter et al (2011) looked at more than just the definition of implementation science and its basic function in the investigative process. They explored the outcomes or the results of the conceptual framework of implementation science itself. The need for evidence-based strategies of implementation, whether for prevention or intervention, is a

significant concern in many genres of research, but implementation science has an additional component that is vital to the success of its process (Procter et al., 2011). That additional component is the outcome of the research-based implementation strategy or the results of the intentional and purposive actions or behaviors used to execute new practices or services (Proctor et al., 2010). In other words, it concerns how effective the process has been and whether it can be used repeatedly to extract the same results or better results each time.

The ideology of outcomes points to the assumption of measurement. It is imperative to be able to understand system or practice failure and specifically whether the failure occurred because of a method or approach that was ineffective in the new setting or because a good method or a good approach that was incorrectly deployed or implemented in the new setting (Cook & Odom, 2013). Therefore, I conducted this study with the assumption that research may be able to provide a best practice or evidence-based methodology that can lead to an effective implementation strategy for one-to-one initiatives across rural schools.

Implementation science provides a pathway for utilizing evidence-based practices in schools (Odom et al., 2013). Per the literature presented by Odom et al (2013), a model was developed by the National Professional Development Center that used implementation science to construct systems of professional development, which expanded the quality of services provided and advanced teachers' use of evidence-based practices. The systems of professional development that were built on the principles and underpinnings of implementation science were more likely to lead to the acceptance of

innovations needed to increase the quality of special education services and use of evidence-based practices among students with autism. Implementation science moves practice from the laboratory research environment to everyday use in authentic settings under the control and supervision of a teacher, practitioner, or administrator.

Moving from research to practice occurs when the building blocks of implementation science are put into practice and are aligned with research-based established protocol (Cook & Odom, 2013). The implementation science framework, as noted in Chapter 1, considers five domains: (a) intervention characteristics, (b) outer setting, (c) inner setting, (d) characteristics of the individuals involved, and (e) the process of implementation (Damschroder, et al., 2009). Intervention characteristics is the consideration of the complexity of the intervention and its elements. Outer setting is the examination of the needs to be addressed and the resources available and the political and economic context. Inner setting is a look at institutional culture and leadership engagement as well as communication channels. Individual characteristics is the consideration of individual perceptions, mindsets, feelings, and behaviors. The process of implementation is the examination the planning process, evaluation strategies, and reflections of those involved.

Normalization Process Theory

The NPT is a sociological construct that provides a set of tools to aid in the understanding and explanation of the implementation process related to social and technological interventions and innovations in a specific environment, for example, education (McEvoy et al., 2014). NPT was born out of a model constructed based on

understanding the implementation of technologies (McEvoy et al., 2014). Subsequently,

the model was expanded and used as the underpinning for the conceptual framework of

implementation science (McEvoy et al., 2014). NPT identifies four determinants (sense

making, engagement, collective action, and reflexive monitoring) of normalizing

complex implementation processes and translating the processes into practice (Byrk,

2016). In complex environments, such as education, NPT may be a vital underpinning to

aid in guiding the implementation process to determine at which point the adaptive

process will take place to further aid in effective implementation.

Adaptive Implementation

Procter et al (2011) looked at more than just the definition of implementation

science and its basic function in the investigative process. They explored the outcomes or

the results of the conceptual framework of implementation science itself. The need for

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domains: intervention characteristics, outer setting, inner setting, characteristics of the

individuals involved, and the process of implementation (Damschroder, et al., 2009). Intervention characteristics considers the complexity of the intervention and its elements. Outer setting examines the needs that are attempting to be addressed and the resources available and the political and economic context. Inner setting looks at institutional culture and leadership engagement as well as communication channels. Individual characteristics considers individual perceptions, mindsets, feelings, and behaviors. The process of implementation examines the planning process, evaluation strategies, and reflections of those involved.

Application to Study

In this study, implementation science and NPT were used during the data collection and data analysis phases. Implementation science was used to explore the process of employing a practice into a system or organizational structure. During the data collection phase, I intentionally capitalized on the processes of implementation noted by the stakeholders and compared and contrasted those processes with the research-based implementation processes from the literature. NPT was used to determine at which point the new process became a recognizable routine during implementation. During the data analysis phase, the data was examined to purposely look for a routine that was established or normalized during the implementation phase and examined whether that routine proved to be successful for the school or unsuccessful for the school, based on the data.

Normalization can be a hidden process and not discovered until after the implementation has taken place and been evaluated. Therefore, the purpose of this study,

was to use implementation science with its substructures from NPT to aid rural schools in recognizing the pitfalls to successful implementation of the one-to-one device initiatives. As noted in Chapter 1, the five domains of implementation science were aligned with the research questions for this study. The first research question, (How does implementation of a one-to-one initiative occur in a rural school district?) was aligned with domains 1 (intervention characteristics) and domain 5 (process of implementation). Research question 2, (What factors influence the implementation process?) was aligned with domains 2 (outer setting) and 3 (inner setting). Research question 3 (How do the views of stakeholders' influence decisions in implementing a one-to-one initiative?) was aligned with domain 4 (individual characteristics).

Literature Review Related to Key Variable and/or Concepts

The next sections discussed what was found in the literature relative to the research problem under investigation. Three key areas were explored: implementation of laptop programs in schools, the context of rural schools, and strategies and research studies related to technology integration in schools.

Mobile Technology Implementation to Schools

Studies have found a positive relationship between one-to-one initiatives and student engagement (Argueta et al., 2014; Crompton & Keane, 2012; Penuel, 2006). Seven states (Florida, Michigan, Maine, North Carolina, Texas, Pennsylvania, and Virginia) participated in a study (Argueta et al., 2014) that revealed one-to-one initiatives enhanced student engagement, and improved 21st Century technology, learning, and innovation skills among students as well as increased cooperative, collaborative, and self-

directed learning (Domingo & Gargante, 2016). The seven-state study also revealed a positive correlation relative to pedagogical practices in the classroom with the use of mobile technologies (Argueta et al., 2014; Domingo & Gargante, 2016). Penuel (2006) asserted learning with and learning from the use of technology has the potential to provide a highly useful and conceptual technological pedagogical knowledge framework when the teacher integrates information computer technology in the learning environment. Parents also reported positively concerning the outcomes of students' motivation relative to the implementation of one-to-one laptop initiatives in schools (Holen et al., 2017; Penuel, 2006).

Furthermore, the implementation of mobile devices fostered a positive relationship between student achievement, discipline, attendance, attitudes, and the teachers' ability to differentiate instructional and learning practices in the educational environment (Power et al., 2020; Rosen & Beck-Hill, 2012). Experiential learning, using mobile technologies, increased academic growth, reduced numbers of unexcused absences school wide, and improvement in disciplinary infractions were experienced (Rosen & Beck-Hill, 2012). Mobile technologies have a tremendous potential to transform education; however, these technologies must be designed and implemented in a way that they are socially and culturally relevant to the school environment where they will be used (Keengwe & Bhargava, 2014; Power et al., 2020).

The use of mobile technologies in the classroom has provided a wide array of possibilities with the evolving content and materials supported by the mobile technology (Cavanaugh & Hargis, 2014). The classes, where mobile technologies were integrated,

spent more time with student-talk, productive student activities, and collaborative activities after the integration than before the integration (Bergdahl et al., 2020). The participating institutions in Cavanaugh and Hargis' (2014) study credited this success to the effective use of mobile technology as a differentiated and customizable cognitive toolbox for learners. Although some institutions experience positive effects of implementing mobile learning tools, other institutions of education may not have that same experience (Bergdahl et al., 2020). This is partially due to the lack of research driven models for implementation that can be used across multiple academic disciplines and contexts that will yield the same results each time the model for implementation is implemented (Albion et al., 2015; Warshauer, Zheng et al., 2014).

Sung et al (2015) conducted a meta-analysis revealing, and further substantiating, the progressive support that mobile devices foster in the areas of social learning, social connectivity, context, environmental sensitivity, and individuality. Desktop (stationary) technologies may not be able to provide the exact same progressive supports in those areas due to their inability to be portable and sensitive to context and individuality. Mobile devices have made learning flexible, synchronous, and collaborative. Furthermore, mobile technologies have the potential to transform the traditional teacher-focused instructional environment into one that is learner-centered and learner driven (Sung et al., 2015). Learning that takes place in both traditional and unrestricted settings (home or other social contexts), may employ a greater effect by connecting formal and informal learning and individualizing the learning experience for the learner. Mobile technology has provided a variety of new ways to learn included promoting a relevant

learning experience and increased engagement of students while learning using mobile technologies (Domingo & Gargante, 2016).

The positive effects that mobile technologies have had on student learning have extended beyond high school to post-secondary institutions of higher learning (McGuinness & Fulton, 2019). One initiative began by empowering twenty instructors (across three institutions in the United States), through developmental training, to efficiently integrate mobile learning tools into their classrooms and become 'champions' or mentors for other faculty members who would later embark on the same journey (Cavanaugh & Hargis, 2014). Students were more engaged in the learning process as a result of the implementation of the mobile learning technology (McGuinness & Fulton, 2019). The students could experience authentic learning anytime and anywhere, whether in the school setting or outside of the school setting (Cavanaugh & Hargis, 2014) with the use of a technology that is able to be mobile with the student. The mobile learning system uniquely supported the essential actions of monologue, dialogue, reflection, conversation, and interaction.

As with the findings of Cavanaugh and Hargis (2014), Harper and Milman (2016) agreed that there is a direct correlation between the use of mobile technologies to support reading and social learning (group work synchronously and asynchronously) and the increase in proficiency regarding contextual reading and social learning within the school context and outside of the school context. Harper and Milman reported small gains in achievement in the subjects of math and reading after the implementation of a one-to-one initiative across fourth graders in a low socioeconomic school. Students could use their

laptops to access media that supported their learning in those areas, thereby, increasing their level of proficiency. The study also examined a one-to-five initiative (one laptop every five students) and compared it to a one-to-one initiative and students in the one-to-one program out-performed the students from the one-to-five model in math. The finding suggests that the one-to-one model promotes the individualized and customizable style of learning regarding the unique context of the learner (Harper & Milman, 2016).

Warshauer et al (2014) examined three schools (Alabama, Colorado, and California) within the United States in relation to their process of implementing mobile devices for each student. These schools embarked on a journey to improve instruction and learning (through the use of mobile technology) and to narrow the gap between the socioeconomic status of high income and low-income students concerning access to digital technologies. All three schools employed the lower cost version of netbooks instead of PC laptops and MacBooks. Although, they employed like technology, the experience of each school was unique, and they had very different outcomes of the mobile technology integration (Hockly, 2016). The schools involved in this study were elementary schools serving third and fourth graders from each state (Alabama; Colorado; and California). Alabama, as of 2014, had experienced the largest scale one-to-one laptop initiative in the United States (Warshauer et al., 2014).

The implementation examined in this study was done in Birmingham, Alabama in a school where more than 80% of its students received free and reduced meals. The dynamics and culture of this school posed a challenge for school administrators, teachers, and students regarding the implementation of the mobile technology. However, the

decision to fully implement was not shared with the teachers prior to beginning the implementation process. Therefore, inadequate training for teachers was a factor, teacher acceptance was a factor, and student efficacy became a factor when students began to feel overwhelmed with the responsibility of compliance to use a device that they were not trained to use or had not used on a consistent basis. These factors equated to a process that did not model successful and informed implementation (Warshauer et al., 2014). Although the implementation experienced several barriers related to teacher and student preparedness, the school reported increased student comfort on researching, blogging, and production of media assignments (Power et al., 2020).

The California school in this study had a completely different dynamic and reason for its implementation. The student body was comprised of only 13% of students that received free and reduced meals. They implemented the one-to-one device model to improve writing scores on a technology assessment and to support the English language acquisition of English as a Second Language students (ESLs). Contrary to Birmingham's school, the California school's implementation process involved stakeholders' participation from the inception of the process. The selection of the device, development of instructional practices, and the implementation of the program were a result of the participation and communication of school administrators, teachers, parents and students. California employed a multi-layered implementation process that allowed them to study the process as it happened.

During the school year of 2007-2008, the California school studied other implementation programs, for school year 2008-2009 they partially implemented the

mobile devices using only half of the school year, and in years 2009-2010 the school

fully implemented the mobile devices across an entire grade level. Each school year

teachers received 40 hours of technology training regarding the writing program being

used to improve writing scores for students and 40 additional hours of training by a

teacher mentor. Additionally, this school collected data from students and teachers to

continue to measure its implementation process to ensure continued growth of its success

(Warshauer et al., 2014).

      The school in Colorado (Warshauer et al., 2014) was used to compare data with

the school that was a part of the study in California. The data collected revealed that there

was a week-long training for teachers prior to school (in Colorado), but not to the

magnitude of the preparedness experienced in the California school portrayed in the

study. The study did not report the level of success for the Colorado school, but did

mention the implementation of the mobile devices were implemented to support the

writing skills of their ELL students (their ELL population was over 70%) and the mobile

technology allowed the students to practice writing and editing more proficiently than

they did prior to the implementation (Hockly, 2017). The driving force behind any

integration is the preparedness of the stakeholder (Penuel, 2006). The findings of the

study conducted by Warshauer et al. (2014) further illuminated the gap between

successful and unsuccessful implementation; yet, the data did not reveal a prescriptive

process on how to successfully implement one-to-one devices across like contexts and

academic disciplines. Moreover, Montrieux, Vanderlinde, Courtois, Schellens, and

DeMarez (2014) asserted it takes careful and long-term planning before and after the

mobile implementation process for schools to experience sustained benefits of the program.

Teacher Perceptions on Implementation

In the digital age the possibilities of educational technologies, such as mobile technologies, cannot be ignored or discounted considering the potential it can provide for the learning and instructional interface for students and teachers (Montrieux et al., 2014). Mobile technology implementation is becoming increasingly prevalent in schools; however, the component determining the success or failure of the implementation, specifically the teacher, is sometimes not exposed (Power et al,, 2020). According to Montrieux et al. (2014), teachers' attitudes and philosophies, concerning technology integration, play an important role in determining the success of the implementation process. Successful implementation of computing devices may require the teacher to modify his or her role and that will compel the teacher to acquire additional skills and responsibilities (knowing how to integrate and being familiar with the specific device and software) in addition to teaching skills (Power et al., 2020).

Montrieux et al (2014) stated teachers, at the school where the case study was conducted, expressed feelings of inadequacy technically and pedagogically in the area of implementing mobile technologies into the curriculum. Teachers questioned when to use the mobile technology and how to use it. (Montrieux et al., 2014). Additionally, teachers felt that the mutual exchange of expertise among colleagues would be beneficial in sharing new ideas and practices to support instruction in their classrooms (Power et al., 2020). Teachers wanted protected time to learn what to do and how to best use the

technology. The changing role of the teacher, during the implementation phase, was a determining factor in teachers expressing the need for in-service training programs relative to technology integration (Albion et al., 2015).

The unpreparedness of the teacher or lack of professional development can derail the implementation process. Dundar and Akcayir (2014) and Reid (2014) reported instances of teacher frustration directly related to their readiness level concerning implementation of mobile technologies. Additionally, in the study conducted by McCoy (2016), where the implementation took place on a college campus, the teachers felt the process lacked a progressive approach to training how to effectively integrate the mobile devices (laptops) into the learning environment. The instructors expressed challenges with classroom management that they attributed to the students being distracted by the devices above using the devices for educational purposes process (McCoy, 2016). There is still much to be learned concerning the gaps in the perceptions of teachers and school administrators relative to implementing one-to-one devices in the learning environment.

On the other hand, Storz and Hoffman (2013) conducted their study at a middle school, but revealed some teachers felt overwhelmed with disciplinary challenges due to the implementation of the new technology. Other teachers reported that giving up control of the classroom to project based learning (as a result of the one-to-one initiative) and adapting to a new style of pedagogy was challenging and took more time than anticipated. Also, some teachers reported that discipline issues came in the form of cheating in conjunction with the distraction of students accessing games online (Blau et al., 2016). The overwhelming perceptions of the teachers were in the area of pedagogy,

classroom management, and the lack of adequate professional development before the implementation process began (Storz & Hoffman, 2013).

Moreover, Dundar and Akcayir (2014) examined barriers to implementation and discovered that teachers that lacked prior experience in computing were not as accepting of the technology integration as the more experienced teacher and the learner that was more knowledgeable of the computing process. Preparedness posed a barrier to implementation of the laptop initiative (Dundar & Akcayir, 2014; Reid, 2014; Blau et al., 2016). Storz and Hoffman (2013) reported mixed feelings among leaners concerning the implementation of the MacBooks in their school. Some learners felt that instruction had become mediocre and stated that nothing had changed, except instead of using paper to write, they now type.

The research further disclosed that the learners' ability to create relevant projects, using the mobile devices, supported learning better. However, the literature also disclosed that this was not a consensus among all learners and that some of them felt that the learning experience was not as productive prior to the one-to-one initiative. This was partially attributed to the lack of classroom management and teacher efficacy and training regarding the implementation process (Storz & Hoffman, 2013; Domingo and Garganté (2016) conducted a study in Spain on the perceptions of teachers in relationship to mobile learning. The study revealed that teachers' perceptions about the impact of mobile learning directly influences their belief and practice concerning the effectiveness of mobile technology implementation.

Additional studies have determined the way teachers perceive the impact of technology directly effects their use of technology in instruction in the classroom (Badia et al., 2014; Inan & Lowther, 2010; Zheng et al., 2016). Educators have great influence and control over the learning environment; therefore, their perception largely determine how much diffusion of mobile learning will take place in the classroom. Teacher perceptions of mobile technology integration were specifically related to professional development resources, hardware and software relevancy in the curriculum, how user friendly the technological environment was, and the offer of an incentive to actually transform pedagogy (Mac Callum et al., 2014).

Rural Schools

The U.S. Census Bureau (2016) has defined a rural populace as all territory, housing units, and locales of a town or city that has not been included in urban development. Rural communities are more underdeveloped and underpopulated in comparison to urban and suburban communities (Chambers, 2014; Power et al., 2020). More than 30% of schools in the Unites States are considered rural and Mississippi has been declared a rural state by the U.S. Census Bureau (National Center for Educational Statistics, 2013). Rural schools are the product of their rural communities and are plagued with under-resourced classrooms (Power et al., 2020). Rural schools have a distinct characteristic and culture that lend to the motivation of the students in which they serve (Hardre et al., 2009). These schools serve a large number of minority students, families with low socioeconomic status, single parent homes where the parents have little education, and more than half of their students eat free and reduced meals (National

Center for Education Statistics, 2016). Additionally, the National Center for Educational

Statistics (2013) reported that more than half of American Indian/Alaskan Native,

Hispanic, and Black students, in remote rural areas, attended high poverty schools.

Most rural schools offer fewer support and fewer extra-curricular activities than

do schools that are non-rural (Hardre et al., 2009). Teachers are expected to be the

experts in multiple subject areas and for multiple grade levels in rural schools. The

culture of the rural school is significantly different when compared to urban and suburban

schools due to the poverty level of the rural community and the students that rural

schools serve (Hardre et al., 2009; Power et al., 2020)). The U.S. Department of

Agriculture (2016) reported that all rural schools have the following commonalities.

- Less than 500 people per square mile

- Prevalence of low skilled jobs

- Majority without post-secondary education

- Majority below poverty level

- Isolated or remotely located communities

The compilation of these characteristics has created an access to resource disparity for

schools that fit the model for rural schools as defined by the U.S. Department of

Agriculture (2016) and the U.S. Census Bureau (2016).

Technology Access in Rural Schools

Access to technology has been a prevalent area of interest in national public

education dating back to the No Child Left Behind Legislation (NCLB) signed into law in

2002 (U.S. Department of Education, 2002). The U.S. Department of Education

(USDOE) (2002) made a deliberate attempt to increase access to technology for rural and poverty-stricken schools at the elementary and secondary levels. The NCLB legislation mandated the use of technology to improve student performance and partnered with sub grantees, such as Educational Technology State Grant Programs, to foster equity in access to technology for under-resourced elementary and secondary schools. Moreover, the new legislation, Every Student Succeeds Act (USDOE, 2016) enacted under President Obama's administration, emphasized implementation of researched based strategies for technology integration in schools, allowed federal funds allocated to school districts be used for professional development purposes to aid in the technology integration process, and mandated a national study to examine under which condition the technology integration was effective in fostering student achievement (USDOE, 2016).

Prior to the enactment of the ESSA (Every Students Succeeds Act) legislation, the United Stated Department of Education took additional measures to increase technology access in our nation's public schools (U.S. Department of Education, 2017). President Barak Obama introduced the ConnectEd Initiative in 2013 designed to enrich K-12 education by increasing broadband internet service for 99% percent of students in America by 2018 (Whitehouse.gov, 2016). During the beginning of the ConnectEd Initiative only 39% of public schools had wireless network access for the whole school. Additionally, low income and less educated households experienced a greater disparity in their communities and schools for wireless network access than those who were in higher income and higher educated populaces (NTIA, 2013). Therefore, perpetuating the digital divide for rural under-resourced communities and schools.

Due to the disparity of technology access for low income, under-resourced areas, rural schools have experienced an inequity in technology access as a direct effect of their characteristics and culture (lower income, under educated, and remote locales) (Real, Bertot, and Jaeger, 2014). The unattractiveness of the widespread low-density population has created a challenge to attract high quality teachers and promote a diverse course offering for 21st century innovative jobs (ROCI, 2015). Therefore, rural secondary schools could especially benefit from the possibilities of increased course offerings that digital access could provide through the use of Internet based academia (ROCI, 2015).

The state of Idaho conducted a study (ROCI, 2015) substantiating the unique characteristics of rural schools as described in the previous paragraphs. The study revealed the underlying contributions of the technology disparity for rural schools in Idaho as low population density and lack of innovative industry in the rural areas. The lack of innovative industry had a direct impact on financial resources needed to fund digital access, digital literacies, digital equipment (laptops), and fund teacher professional development on the use of digital technologies (ROCI, 2015).

Integrating technology into all classrooms has the potential to transform learning and teaching. However, within the unique characteristics of many rural schools is embedded the most challenging ingredient to technology access, funding (Sundeen & Sundeen, 2013). Many rural schools are located in unincorporated areas with little industry and infrastructure to provide access to digital technologies (Salemink et al., 2017). On the other hand, some rural schools have digital access, but their teachers lack access to professional development (due to funding) to support the adequate use of the

technology (Rowsell et al., 2017). Additionally, many rural districts have high student to teacher ratios, resulting in a diminished timeframe to participate in training for digital literacies.

Therefore, teachers spend their time looking for open source digital literacies to expose their students as much as possible to the 21st century wave of knowledge acquisition and learning (Goh & Kale, 2016). Technology access is not equitable between rural and suburban schools (Salemink et al., 2017). Suburban schools are situated in middle to high income areas where business and industry play an integral role in funding of the suburban school (Sundeen & Sundeen, 2013; Salemink et al., 2017).

Furthermore, some rural schools that do have access to digital technologies and access to the World Wide Web experience slow connections due to the type of infrastructure used to when constructing the network because of decreased funding and not being able to afford the bandwidth necessary to successfully run every device on the network simultaneously (Sundeen & Sundeen, 2013; Gallardo, 2016). There is much to be considered relative rural schools and the digital divide. Rural schools have the challenge of identifying the most cost-effective digital resources which may or may not be conducive the learning needs of students (especially those receiving special education services) and the instructional needs of teachers. Many times, rural schools are forced to settle and accept what is affordable at the time, regardless of their current educational needs (Sundeen & Sundeen, 2013; Gallardo, 2016).

Rural Schools in Mississippi

The state of Mississippi faces disparities relative to access to technology due to its rural geographical structure. According to the Mississippi Institution of Higher Learning (2011), 54.1% of all Mississippians live in rural areas. Mississippi has 82 counties and 57 of them are considered rural by Consumer Finance.gov (2014). According to Columbia University's Hechinger Report, Mississippi is the least wired state in the nation and earned an F on the Digital Report Card published by Digital Learning Now (Columbia University, 2014). The growing problem in Mississippi, where access to technology exists, is a low speed network and this exacerbates the digital divide (Gallardo, 2016).

Some public schools in Mississippi have begun to implement one-to-one device initiatives and these schools are leading the way for more Mississippi schools to become connected (State of Mississippi, 2020). Clinton Mississippi School District, which is partly urban and partly rural began its one-to-one device initiative implementation in 2012. However, the schools located in the rural areas of the Clinton School District faced deeper challenges with implementation due to poor connectivity and lack of funding for the schools located in the rural areas (Columbia University, 2014). On the other hand, school districts like Greenville in Mississippi lacked the economic structure to employ such an undertaking as Clinton Public Schools. More the 93% of Greenville's students qualify for free or reduced meals. The Greenville School was not an early adopter and as of this report have not successfully moved toward implementing the one-to-one device initiative. The one-to-one initiative was out of reach financially for this district, where all new initiatives rely on federal funding (Columbia University, 2014). Without proper

funding, which is the most prevalent digital divider for rural Mississippi schools, one-to-one device initiatives are virtually impossible to implement (Mississippi Institution of Higher Learning, 2011).

Rural schools have often struggled with obtaining resources due to the nature of their low socioeconomic status and geographical location (Chambers, 2014; Power et al., 2020). Low socioeconomic status can place limitations on acquiring academic resources needed to provide students and teachers with the digital literacies needed to stay competitive and innovative (Chambers, 2014). Additionally, remotely located rural schools continue to face challenges connecting to the Internet due to the growing cost of the infrastructure needed to keep them connected (Chambers, 2014). Oftentimes, rural schools are located too far away from digital access points that would give them a more effective way to connect and stay connected to the Internet (Power et al., 2020).

Data collected from Consumer Finance.gov (2014) disclosed the percentage of Mississippi counties that are classified as rural. Approximately 70% (57) of Mississippi's 82 counties are rural, and of those 57 counties 28 are in critical shortage areas and are either F or D schools (Mississippi Dept. of Education, 2016). Consequently, 49% of rural school districts are underperforming as defined by Mississippi's School District Performance Grading Standards for school districts. Table 1 depicts an explanation of the grading system for school districts in Mississippi (Mississippi Center for Public Policy, 2012). Mississippi schools that perform at D and F levels rely on federal funding more heavily than those that perform at A through C levels (Columbia University, 2014).

Therefore, some rural schools continue to be underfunded based on their academic

performance.

Table 1

Mississippi Schools' Student Performance Scale and Scale Definition

Grade scale	Definition
A	High performing
B	Successful
C	Academic watch
D	Low performing
F	Failing

Under-funding is the result of the lack of industries that locate in rural areas;

thereby, contributing to the increased deficiency of digital resources and growing poverty

levels experienced by many rural communities (Hardre et al., 2009; Power et al., 2020).

Although new technology or digital resources, such as one-to-one device initiatives, offer

rural school districts vital tools for overcoming the difficulties of isolated and sparse

populaces, rural districts often experience barriers to successfully implementing these

technologies (Gordon, 2011).

Strategies for Implementing Social Change

As digital learning tools become more affordable and communities recognize the

importance of educational technology, some school districts have begun to implement the

one-to-one device initiative with the premise of bringing personalized learning to every

student (Downes & Bishop, 2015). Downes and Bishop (2015) examined the

implementation process of the one-to-one laptop device in a middle school in the state of

Vermont. During the implementation process, the findings revealed a significant

correlation between school culture and teacher efficacy relative to technology integration into the middle school curriculum and teacher relationships with students.

There was a lack of trust between teacher and student (due to the school and community cultural gap); thus, undermining the teachers' confidence to build meaningful technology rich, community-based activities for the students. The students were equally frustrated concerning the lack of relevance related to technology integration, community, and the curriculum (Downes & Bishop, 2015). The students communicated they were supposed to do some technology-based activities outside of school and never received the opportunity to complete those tasks.

This study took place over a four-year period, and within that time frame, teachers had to realign their goals and objectives to better serve their students using technology, in consideration of the community's culture. The disconnect during implementation was not the lack of teacher competence, but the disconnect between school and community culture. Relevance became the driving force for meaningful technology integration. The students wanted to use the technology to produce artifacts they were familiar with, but still somehow connected to the curriculum. Although, all teachers did not adapt to becoming community culturally sensitive, the teachers that did experienced a more positive and meaningful implementation process within their classrooms (Downes & Bishop, 2015).

On the other hand, some Victorian schools in Australia are implementing the Bring Your Own Device model (BYOD) instead of the one-to-one device initiative (funded by schools) to save money (Janssen & Phillipson, 2015). These devices are being

implemented at the secondary school levels. The BYOD model is the students' own

school approved personal computing device, that they bring from home, to be used in the

classroom for learning. The BYOD model is a type of one-to-one computing initiative

also. Unlike most of the models implemented in the United States, the Victorian

government has a DigiPub called, Planning for One-to-one Learning that outlines key

steps, in detail, for planning, preparing, and implementing the one-to-one device learning

initiative in their schools (Janssen & Phillipson, 2015).

The document provides links to research and best practices to support the

implementation process, according to Janssen and Phillipson (2015). The research

suggested that the most effective implementation takes place when the school engages the

community in the decision-making process and the stakeholders in the community have

an open stream of communication with the school. However, due to the socioeconomic

differences in the state of Mississippi from that of the Victorian model, the BYOD

program or initiative may not be an option, as most of the students may not be able to

afford their own personal devices. The rural school where my study will be conducted

has a 56% free and reduced lunch population, quantifying it as an impoverished area,

economically (U.S. Department of Labor, 2017).

Pedagogical practices are integral to the strategic process to implement change in

the mobile learning environment (Domingo & Garganté, 2016). Cochrane (2014)

examined six critical success areas relative to implementing strategic change in the

mobile learning environment. Critical success areas, as defined by Cochrane (2014), were

factors that were crucial to developing pedagogical change in a course resulting from the

implementation of mobile learning. The following are the six factors identified by

Cochrane (2014).

1. The instructional integration of the technology into the course and assessment

2. The teacher modeling the instructional use of the technological tool

3. Creating a supportive learning community for students and teachers

4. Appropriate selection of mobile device and software tools

5. Technology and pedagogy support that is ongoing

6. Creating a sustained interaction that fosters the development of philosophical
   tenets for both teacher and students (mobile technology implementation must
   be goal oriented and directed)

The philosophical or ontological shift in the tenets of mobile learning is a critical factor

in the success of pedagogical practice in the mobile learning environment. Since the

teacher is the vital constructor and sustainer of the process in the classroom (where it

matters the most), the process of re-conceptualizing pedagogy (the shift) is the most

challenging aspect of implementing strategic sustained efforts to ensure the progressive

success of the holistic implementation process (Cochrane, 2014). Mobile learning

initiatives do not fail because of lack of use, but due to misguided use and ineffective

integration of the technology (Haper & Milman, 2016). When stakeholders think of

implementation, they think of the devices' diffusion and not the clinical practice of the

teacher in the classroom. It is that practice that determines effective implementation and

progressive innovative pedagogy (Domingo & Garganté, 2016).

Moreover, the University of Maine (2011) conducted a study of early deployment of one-to-one devices across the state of Maine, inclusive of rural schools. The results indicated the lack of technology training time for teachers in rural school districts and this contributed to the decreased success of implementation. Technology training is an essential strategy for implementing change relative to the one-to-one device initiative (Domingo & Garganté, 2016). It is rare to see a mobile learning project move through the various stages of implementation successfully and become an integral part of routine practice in the classroom (Chee-kit et al., 2014); however, improvement and change can take place by sharing best practices and successful innovation by other schools that share the same context.

Understanding the change process is a vital component in reforming or restructuring any educational setting, regardless of school context, whether the school is classified as rural or not (Chee-kit, et al., 2013; Goodson & Rudd, 2016). Such understanding of the change process is related to establishing conditions for progressive improvement to overcome inevitable barriers of implementation and reform (Goodson & Rudd, 2016; Klinger et al., 2013). Chee-kit, et al. (2013) described four stages of implementation when using evidence-based practice to diffuse an innovation into the educational setting. The four stages were (1) emergence, (2) demonstration of what the school can do relative to capacity, (3) elaboration, and (4) system or schoolwide adoption and sustainability. Emergence happens when the school leaders, with the support of internal and external stakeholders, decide that the process is doable considering resources and capacity.

During the demonstration phase, the researchers (those that have been tasked with searching data and other school's one-to-one adoptions, within its context) determine whether the implementation is feasible relative to outcomes pre-defined for successful implementation. When the elaboration phase occurs, teachers implement the schoolwide initiative drawing from what was learned or gained during the demonstration phase and build on the capacity of the school leaders (principals and superintendents) to implement the new initiative. Finally, during phase four (system or schoolwide adoption), the practices associated with the implementation are integrated into the daily routine of the school, and a norm is established in an effort for the practices to be continued over time (Chee-kit, et al., 2013).

The normalization theory supports this conceptual lens for implementation and creates a path for the progression of the educational innovation or one-to-one initiative based on evidence from the learning and teaching practices that are experienced in the classroom (Norris et al., 2013). One must remember that implementation and design of mobile technologies (one laptop, one student) pose technological and socio-cultural challenges (Goodson & Rudd, 2016; Keengwe & Bhargava, 2014). Therefore, one size fits all or one technology for all contexts does not realistically work. In other words, each context is unique and more research for implementing change, relative to context, is needed (Barr, 2018; Keengwe & Bhargava, 2014). The dynamics of the rural school environment require a catered to strategic method that is sensitive to its structure, socioeconomic status, and cultural needs (Laferreire & Searson, 2013; Power et al.,

2020). Therefore, success hinges on these very unique needs being met during the implementation phase (Laferreire & Searson, 2013; Power et al., 2020).

Summary and Conclusions

This literature review addressed the use the of implementation science in conjunction with NPT in attempting to establish a framework for implementation in the social sciences, including education. Additionally, this literature review research acknowledged the emerging concepts of implementation and the additional research needed to understand how it can be used to assist in the development of effective implementation measures in rural schools relative to one-to-one device adoption and employment. Moreover, this review of literature discussed the barriers to implementation that were unique to rural schools and suggested strategies that may aid rural schools in overcoming such barriers.

The literature review described the positive correlation between student engagement and mobile technologies in the classroom, but also disclosed the mixed perceptions of teachers concerning technology implementation and use. On one hand, the teachers felt overwhelmed with the implementation process, and on the other hand, the teachers communicated their frustration with the lack of preparation for the use of the devices in the learning environment. These perceptions directly impacted the methodology by which teachers implemented the devices. In the literature review, there was an implicit correlation between rural under-resourced areas and digital access. The rural under-resources areas experienced disparities in socioeconomics which led to a diminished ability to provide schools with adequate access to digital technologies. Rural

schools in Mississippi, particularly, experienced issues with connectivity and speed of connectivity which eventually led to a deeper divide over time.

The next section describes the methodology of this research study and the purpose the research design and strategy that is used. Conducting a case study, under the umbrella of qualitative research, while employing a purposeful selection of teachers, board members, members of the school community (PTA), school technology personnel, and school administrators, will provide general and specific data needed to create a pathway for effective implementation of one-to-one devices in rural high schools that are similar to the high school described in this study.

Chapter 3: Research Method

Introduction

The purpose of this qualitative case study was to explore the implementation of a one-to-one laptop initiative in a rural school, with a focus on policy development and stakeholder views. Technology integration has not always been tested before implementation, and stakeholders often provide support to technology integration before adequate testing and training is provided to teachers (Berrett et al., 2012; Shepherd & Taylor, 2019). Schools offer quick fixes, such as workshops and seminars, that inadequately meet the training needs of educators involved in the implementation process (Fletcher, 2009; Heath, 2017; Meister, 2010). As a result, one-to-one initiatives may be at an increased risk for unsuccessful implementation from their inception.

Additionally, this study provided an in-depth understanding of potentially unique factors affecting implementation of such initiatives in underresourced rural districts. Despite the substantial investments poured into one-to-one computing initiatives by school districts, there remains much to be learned concerning which aspects of program implementation work and which aspects do not work (Howard & Rennie, 2013; Power et al., 2020). Findings of this study may add to the present body of knowledge available to rural schools as they contemplate adopting a one-to-one initiative in their districts. The research questions that guided this study were the following:

RQ1: How does implementation of a one-to-one initiative occur in a rural school district?

RQ2: What factors influence the implementation process?

RQ3: How did the views of stakeholders influence decisions in implementing a

one-to-one initiative?

The research design for this study was a single instrument case study. A case study takes

an in-depth look at individual experiences, the perceptions of a person or a group of

persons who share homogeneous characteristics that are a part of the study and extracts

these experiences to provide insights into the phenomena or process under investigation

by the researcher (Yin, 2011). The subsequent sections include a discussion of the study's

(a) research design and rationale, (b) role of the researcher, (c) methodology, and (d)

issues of trustworthiness.

Research Design and Rationale

The research design for this study was a single instrumental case study. A case

study may reveal why gaps exist in a process or why one implementation strategy may be

preferred above another (Robinson, 2014). Additionally, qualitative researchers uncover

meaning relative to how experiences are understood and interpreted by individuals

(Lodico et al., 2010). In a case study, the researcher may conduct a purposive sampling

due to accessibility of subjects and the nature of the research being conducted (Robinson,

2014). In a purposive sampling, the researcher deliberately selects the subjects or setting

based on the research questions guiding the study. In this study, I used a purposive

sampling to select individuals directly involved in a one-to-one initiative program. A case

study provides an embedded analysis and deep description of the case and it can provide

rich understanding of complex issues or phenomena (Ladico et al., 2010). Case studies

employ a limited number of detailed situational events and conditions and are employed

to seek understanding of how they interrelate (Ladico et al., 2010). Additionally, in a case study, the researcher focuses on exploring an event, a process, an activity, or a specific person (Yazan, 2015).

Consequently, the research study and research method must be aligned to accomplish the purpose of the study (Lewis, 2015). The purpose of this qualitative case study was to explore the implementation of a one-to-one laptop initiative in a rural school, with a focus on policy development and stakeholder views. Technology integration is not always tested before implementation, and stakeholders often provide support to technology integration before adequate testing and training is provided to teachers (Berrett et al., 2012; Shepherd & Taylor, 2019). Schools offer quick fixes, such as workshops and seminars, that inadequately meet the training needs of educators involved in the implementation process (Fletcher, 2009; Heath, 2017; Meister, 2010). As a result, one-to-one initiatives may be at an increased risk for unsuccessful implementation from their inception.

Additionally, in this study I sought to provide an in-depth understanding of potentially unique factors affecting implementation of such initiatives in underresourced rural districts. Despite the substantial investments poured into one-to-one computing initiatives by school districts, there remains much to be learned concerning which aspects of program implementation work and which aspects do not work (Howard & Rennie, 2013). Findings of this study may add to the present body of knowledge available to rural schools as they contemplate adopting a one-to-one initiative in their districts. Considering the purpose of this study and the research approaches available under the qualitative

umbrella, I considered the ethnographic study, the case study, and the phenomenological study.

With the phenomenological approach, researchers seek to understand the unique experiences of each participant in the study (Maxwell, 2012). However, the phenomenological study may not capture the system-wide or schoolwide experiences relative to the entire implementation process. The ethnographic study examines one specific context and focuses on cultural understanding (Lewis, 2015). This study explored data from one context and did not consider individual experiences of a single teacher or single participant as it was focused on process and not understanding cultural aspects alone.

On the other hand, the case study approach encompasses gathering and examining data of a bound system or case, such as a school district or individual school. Lewis (2015) identified the case study as a methodology that aids in the understanding of complex issues and processes. Yin (2011) described the case study methodology as an empirical inquiry method that provides a basis for the application of ideas and an extension of methods and processes. Therefore, I chose the case study approach as the qualitative basis for my research study.

Role of the Researcher

The role of the researcher is a pertinent part the investigative process. The researcher must understand that fidelity of data has a direct correlation with the integrity of the study. In a qualitative study, the researcher must maintain objectivity throughout the data collection and data interpretation phase of the study. As a colleague of the

participants whom I interviewed, I defined my role as the researcher, which was separate from my role as the colleague. I did not have any personal relationships with the participants whom I interviewed; however, although we did work together in the same school, attended some of the same meetings, and shared the same administrative leadership across district levels, we did not work in the same physical building on campus. I was a fellow teacher and functioned as a member of the schoolwide leadership team. The leadership team did not carry any policy mandated supervisory roles. Therefore, I was not viewed as a supervisor by my colleagues and posed no threat to persuade the thoughts or responses of any teacher participants.

Controlling bias in a qualitative study is necessary to ensure the validity and quality of the study (Creswell, 2012). To mitigate workplace bias, I excluded participants who worked in close proximity with me (on the same campus). Employees are all separated by campuses and do not see colleagues located on other campuses unless a district-wide meeting is held. I also ensured questions were not asked in a manner that appeared to be leading the participant in a specific direction. Additionally, I disclosed the purpose of the study at the time I obtained permission from participants. Moreover, I was vigilant and conscientious of my personal preconceived notions or beliefs and did not allow them to guide the progression of the study, as recommended by Maxwell (2012). The strategies that I employed concerning mitigation of personal biases are explained in more detail in the trustworthiness section.

Methodology

The qualitative research design employs several approaches and each approach may use slightly different data collection methods depending on the approach and the research questions to be answered during the study (Maxwell, 2012). This section addresses the (a) participant selection, (b) instrumentation, (c) procedures, and (d) the data analysis plan of the research study.

Participant Selection Logic

The study took place in a rural school district situated in Mississippi. There were seven schools within the district and the district was comprised of five elementary schools, one middle school, and one high school. The one-to-one device initiative took place at the middle and the high school, but schoolwide implementation only took place at the high school. The populace of the seven schools was ethnically diverse including European Americans, African Americans, Asian Americans, and Latinos. The teacher participants were selected from the high school. There were 81 teachers and 4 principals in the high school. There was one superintendent, 5 board members, 9 technology personnel, and 106 high school affiliated members of the PTA (the PTA consisted of parents and teachers). Only adult stakeholders (teachers, administrators, technology personnel, board members, and parents) participated in the study, and no students were involved in any aspect of the study.

The high school was chosen due to the length of time teachers and students had been using the one-to-one program and due to the implementation being schoolwide in contrast to the middle schools, which did not have schoolwide implementation. The high

school had been using the devices for 3 years prior to selections of the site. Consequently, the high school teachers may have had more experience and perspective relative to the one-to-one device initiative to explore during the data collection process. The participant sample comprised teachers, parents, and administrators who were present during the implementation process. I sampled from a pool of 81 teachers, three principals, one superintendent, one technology director, parents in the PTA (active number of participants varied) and a five-member Board of Trustees in the school district. The high school was divided by department and there were seven departments (Math, Science, History, Fine Arts, Language Arts, Foreign Language, and Electives).

The school district had no written protocol for conducting research; however, the principal directed me to obtain permission from the superintendent to conduct research on any related premise in the district. After obtaining permission from the superintendent, the building principal subsequently granted permission to use the facility to conduct the study (I was directed to follow chain of command). The superintendent agreed to provide written consent allowing me to access district facilities and resources for the study. The PTA was not affiliated with the school district and is an organization outside of the school's authority. Therefore, I contacted the PTA president by email and a follow-up phone call concerning access to its members for the study. When the PTA president agreed, I attended a PTA meeting to explain my study and distribute consent forms and contact information to members who were interested in participating in the study. After obtaining permission from the superintendent and the principal, I sent an email to the principal that included information about the study to be forwarded to teachers. The email

included ways teachers could contact me to volunteer to participate. Teacher volunteers were sent a link to consent digitally to participate in the study.

I contacted the principals, technology coordinator, and Board members individually via email to explain my study and ask them to voluntarily participate. They were also sent a link to consent digitally to participate in the study. I planned to get 7-12 teacher volunteers to form one focus group. Kruger and Casey (2009) posited that focus groups can consist of up to 12 individuals. Additionally, I planned to conduct individual interviews with teachers, principals, board members, the technology department director, and parents (from the Parent Teacher Association) who were familiar with the one-to-one device initiative until criterion saturation was reached, and would continue to seek additional participants until data saturation was met (Kruger & Casey, 2009). In terms of the teacher volunteers, I excluded any teachers who volunteered if they were individuals with whom I had a personal relationship.

According to Maxwell (2012), there is a point of diminishing return in qualitative research. More data or participants do not necessarily mean that the researcher will collect different data. Sample size with qualitative research is much smaller than with quantitative due to the focus of the qualitative case study (Leach, 2005). Qualitative studies focus on the rich experiences and perspectives of participants and not necessarily to generalize those experiences across participants and settings (Crouch & McKenzie, 2006). Using criterion saturation, the researcher can determine when he or she has collected enough data to support the research questions for the study, thereby, determining the number of participants needed for the study (Bowen, 2008).

Instrumentation

The most common data collection instruments in qualitative research are interviews, observations, and document reviews (Thomas et al., 2015). As is common in case study research, multiple data sources will be collected (Yin, 2011). For this research study, three data collection processes were used. These included focus groups with teachers, individual interviews with various stakeholders (teachers, administrators, parents, school board members, technology director), and document analysis. The interview questions asked of each stakeholder group can be found in Appendix A.

Individual Interview

The individual interview guide was strategically developed to maximize the data extraction process and guide the direction of the interview (see Individual Interview Guide in Appendix B). The individual interview guide was used for individual interviews of approximately one hour each with teachers, the superintendent, principals, board members, technology director, and parents who were members of the PTA. Individual interviews may yield the same type of responses as focus groups, but the process differs in that it creates more of a sense of confidentiality for the participant and may not rely as much on groupthink as focus groups (Krueger & Casey, 2009). According to Ritchie, Lewis, Nicholls, and Ormston (2013), individual qualitative interviews tend to reveal more detailed information than focus groups. As a result, the individual interview guide was structured to support the in-depth probing of the personal and unique perceptions of the stakeholders without the suggestive nature and peer influence that are common during focus group interactions (Ritchie et al., 2013).

Focus Group

I invited teachers to participate in one-hour focus groups with follow-up individually if needed for clarification. I created an interview guide using the suggestions from Merriam and Tisdell (2016) and Maxwell (2012). I used the Merriam and Tisdell's (2016) and Maxwell's (2012) suggestions for design, ease of use, and type of questions to ensure the in-depth, rich data is extracted during the interview process (see Focus Group Guide in Appendix C).

I used the focus group method to provide the springboard for collaborative mining between the participants. Focus groups are highly useful and valid in generating data and perceptions that would most likely not develop or emerge without the dynamics found in group interactions (Merriam & Tisdell, 2016). The content validity of the questions asked were relative to opening the pathway for authentic responses and simultaneously supporting full engagement of the interviewees (Maxwell, 2012). Additionally, content validity ensures that the research measures what it was intended to measure (Yin, 2011). Therefore, I used the research questions to align all data collection methods for the study (the research questions must guide the data collection process). Research supports the use of focus groups to extract the meaningful experiences of the interviewees relative the phenomena under investigation by the researcher (Lewis, 2015).

Document Analysis

Collecting artifacts and documents is a common data collection method for case studies. The type of documents collected depend on the study and the research questions to be answered. For this research study, I examined minutes from the Board of Trustees

meetings before, during, and after the implementation phase relative to the implementation process. Additionally, I examined the local newspaper's clippings and coverage of the one-to-one device initiative for the high school covering the periods before, during, and after implementation. I retrieved copies of board meeting minutes from the school district's website. Additionally, I did a search of archival newspaper clippings online from the local newspaper's archival history that pertained to the community meetings held concerning public interest of the one-to-one initiative (See Document Analysis Form in Appendix D).

Procedures for Recruitment, Participation, and Data Collection

Before conducting the fieldwork for the study, Walden requires that permission is obtained from the appropriate officials. I obtained permission from the Superintendent to conduct the study at the high school and explained the purpose and disclosed the participant types (no students) used for the study. After obtaining permission from the Institutional Review Board (IRB) at Walden, I collected data from face-to-face interviews of approximately one hour each, focus group interviews lasting approximately one hour, and documents. The interviews allowed me to become a part of the first-hand experiences of the participants and better understand the perceptions of their experiences (as explained by Maxwell, 2012). Furthermore, audio recording the interviews and the focus group sessions preserved the original interactions of the group for later analysis. During each questioning phase, I used member checking, when necessary, to ensure that what I understood respondents to say was exactly what they were saying.

Participants for the focus groups were selected from a voluntary pool to participate in the study. Teachers received the Consent to Interview Form electronically that explained the research and included the link to consent to participate in the study. Additionally, I emailed the administrators of the high school, the superintendent, and the technology director a consent form with contact information and a link where they could provide consent to participate in the study. Moreover, I contacted the president of the Parent Teacher Association (PTA) to inform him or her of the study and ask him/her to allow me to attend a meeting to explain my study, request volunteers, and distribute consent forms with contact information. The PTA President does not have any supervisory relationship with the PTA members. I attended a PTA meeting and distributed the information.

All signed consent forms I received I scanned to my Norton Lock Safe account that is password protected in an effort to ensure confidentiality and safe handling of data.

Data Analysis Plan

Data analysis is an integral part of the research process where the researcher makes sense of data collected by keeping in mind the conceptual framework and research questions that have guided the research thus far (Merriam & Tisdell, 2016). Analyzing qualitative data is an iterative process. Reflexivity is an integral key in generating insight and delineating data as related to a single instrument case study, and the research questions that guide the study (Srivastava & Hopwood, 2009). The process of reflexivity allows patterns, themes, and categories to emerge from the data and not from pre-described themes of the researcher. I used data from interviews, archived documents, and

focus groups. I coded the interviews, focus group interviews, and documents using line-by-line coding, a strategy that Chamaz (2011) recommended "to bring the researcher into the data, interact with it, and study each fragment of it" (p. 368).

During this open coding, as categories emerge from the various data sets, I assigned data to categories based on the contextual nature of the research questions addressed in the data. Some data were assigned and some data were not assigned to categories as suggested by Srivastava and Hopwood (2009). I continued coding individual interviews, focus group interviews, and archived documents using axial coding that Merriam and Tisdell (2016) recommended. Axial codes emerged as I reflected on and interpreted meanings to identify common themes and patterns that aligned with the purpose of my study. Both initial and axial coding of interviews and documents were conducted using line-by-line coding.

I determined which data were relevant in answering which research questions after patterns and themes had emerged from the data set. I compared and contrasted data from each collection by looking for similarities and differences in the patterns of data as recommended by Palinkas, Horwitz, Green, Wisdom, Duan, and Hoagwood (2015). I interpreted the data set as a whole to provide a clear and cohesive depiction of what was studied (Creswell, 2012).

If discrepant data emerged or data that was not related to the research questions, I did not discount it unless it was isolated, and no other patterns emerged that were similar to the discrepant case. The internal validity of the research hinges on the protocol used to analyze data (Merriam & Tisdell, 2016). In an effort to ensure content validity (Elo. et al.,

2014), I used a purposive sampling that included only the participants who had been

involved in the one-to-one initiative since the beginning phases of implementation. I used

© Microsoft Excel to organize interview data with the research questions and NVivo (a

qualitative data analysis computer program) to assist with the coding process relative to

development of categories and themes (connected to the research questions) and

elimination of extraneous data. The results were analyzed according to the research

questions.

Issues of Trustworthiness

The nature of qualitative research compels the researcher to follow established

and acceptable protocols to protect the validity and reliability of qualitative research

studies (Lub, 2015). Maxwell (2012) stated that validity is relative and must be measured

in connection with the circumstances and purpose of the research. Therefore, content

validity is contextual in qualitative research, depending on the type of setting necessary to

conduct the research. Additionally, it is important to scrutinize every phase of qualitative

research including preparation, organization, data collection, and reporting of results (Elo

et al., 2014).

Credibility

The qualitative researcher can use various strategies for credibility checks during

the data analysis process. Credibility is essential to the research process because it speaks

to the trustworthiness of the study. Additionally, credibility deals with the focus of the

research and how well the data addresses the focus of the research (Palinkas, et al., 2015).

To enhance credibility, I used (1) triangulation using multiple methods and multiple

respondents, (2) respondent validation (member checking), (3) adequate engagement in the data collection process by spending time understanding the unique culture of the rural school setting (4) and providing information to readers for understanding the role of the researcher (as recommended by Maxwell, 2012). Creswell (2012) stated the researcher must look for data that supports the alternative side to avoid bias on the part of the researcher. Also, I used reflexivity by disclosing any personal biases or assumptions I had relative to the research study by keeping a reflexive journal (Maxwell, 2012).

Transferability

The transferability or reliability of the study is concerned with what degree a study can be replicated and get the same results. In qualitative studies, the unique experiences of individuals are used to capture the meaning of a phenomenon. Therefore, it is difficult to create a benchmark that similar studies can use to get like results. Human experiences are not static across settings and situations (Merriam & Tisdell, 2016). As a result, this study may not transfer to other settings, but may be used to provide insights into the successes and barriers to implementation of one-to-one devices in rural school contexts. Shenton (2004) provided strategies for enhancing transferability in qualitative research. I used several of those strategies. I provided detailed descriptions of the context in such a manner that the reader could determine whether or not the findings may be applied to their environment. I provided criteria for participant selection. It is very important to disclose the criteria for selection during the participant selection process and give the unique characteristics of the participants, relative to the study, so that

transferability to other contexts may be determined (Palinkas, et al., 2015). I also

provided detailed methodology.

Dependability

Dependability refers to the constancy or consistency of data over time and under

various conditions (Palinkas, et al., 2015). It measures the potential for alignment

between two or more independent people about the relevance and accuracy of the data.

Therefore, the important question concerning dependability is, will the findings of this

study be replicated if it were conducted using like or similar participants in the identical

context. Strategies that I used to enhance dependability included triangulation through

multiple data sources, intra-rater agreement (also known as the code-recode process) and

maintaining an audit trail to document the study's process and the researcher's decisions

during the study.

Confirmability

In qualitative research, confirmability refers to the objectivity of the study and

how well the researcher's finding can be validated by others. It is imperative that the

researcher takes the necessary steps to ensure, as much as possible, that the finding are

the direct result of the experiences and perceptions of the participants, and not the

preferences of the researcher (Yazan, 2015). Conclusions must be based on data and not

biases or assumptions of the researcher (Yin, 2011). Additionally, Yin (2011) posits that

it is impossible to alleviate all of our human emotions and feelings in a study, but we

must keep the reflective self under control. He suggests that the researcher keeps a

reflective journal and totally disclose his or her predispositions as to not confuse readers with how the data makes meaning for the study.

Yin (2011) also suggested a colleague check of the writing to ensure that the conclusions are supported by empirical evidence. I kept a reflective journal, as stated above. Furthermore, I used the colleague checking technique, suggested by Yin (2011) as another assessment of confirmability. As previously mentioned, I also used member checking to clarify my interpretations of the data.

Ethical Procedures

Protecting the identity of the participants is an important ethical concern of research studies (Lub, 2015). Besides providing confidentiality in the reporting, ensuring that interviews are conducted in a safe environment and assuring the participants the process will not cause undue stress and discomfort is also important to the researcher relative to ethical procedure in research (Lub, 2015). I removed all names from data sets during the transfer process to the software for analysis and replaced the names with pseudonyms. I scheduled interviews in a safe and neutral social setting for the participants. Additionally, I disclosed to the participants, before their participation, the purpose of the study and the maximum amount of time they could expect to spend during interviews and focus groups as noted in the consent forms. Moreover, I disclosed my role and identity to the participants and clearly delineated that their participation was voluntary, they could exit the process at any time, and they would receive no compensation for participation (as recommended by Creswell, 2012). All paper

documentation such as consent forms and transcripts were scanned and stored on Norton Safe Lock. Electronic files were moved to Norton Safe Lock, also.

Finally, I disclosed how the research would be published and who would have access to the study once published (Creswell, 2012), and how long the data would be kept on file before it was discarded. All electronic data was maintained using password protected storage, and all hard copy data was scanned and stored on Norton Safe. I will also ensure that data is discarded in an ethical manner after the appropriate time determined by Walden policy. Disposal of research data is important in maintaining the integrity of the data collected and findings of the study by the researcher. Federal regulations require that research data be kept and preserved for at least three years after the study has been published (University of Virginia, 2018). After the data collection, organization, and utilization phases, I followed the IRB data management cycle. When the data management cycle expires, I will delete electronic copies from all sources (using a commercial software application designed to remove data) and shred paper copies and discard them according to the environmental safety standards in my area.

Furthermore, the Internal Review Board (IRB) at Walden University has an ethics policy that governs research. It is the goal of Walden's IRB to ensure that all applicable research, done by Walden students, complies with its ethical standards and with federal regulations. IRB approval is required at Walden before any data is collected in an applicable research study (Walden, 2017). I followed the IRB process and received permission to proceed with my research.

Summary

In this chapter, a discussion was conducted on the research methods for this study. I provided details about participant selection, data collection instrument, and data analysis plan. I also discussed the research design and rationale, the role of the researcher, the methodology, and issues of trustworthiness and ethical procedures. In Chapter 4, I present the results of my findings, based on data analysis of this single instrumental case study design.

Chapter 4: Results

Introduction

The purpose of this qualitative case study was to examine the implementation process of a one-to-one laptop initiative in a rural school, with a focus on policy development and stakeholder views. This study also provided a better understanding of potentially unique factors that may affect implementation of one-to-one initiatives in underresourced rural districts. School districts pour money into such projects year after year. Despite these efforts, there remains a disconnect between what works and what does not work (Keane & Keane, 2017). The data gathered helped with understanding the perceptions and experiences of teachers, administrators (district and school), support staff, and a community member during implementation of a one-to-one initiative in a rural school. In this study, I sought to narrow a gap in the knowledge relative to the preparation process for successful implementation by considering the necessary support components in a rural setting. It is my desire that the findings of this study will add to the present body of knowledge and create a more sustainable process of implementation of one-to-one initiative in rural schools.

Three research questions for this study were about the perceptions and experiences of teachers, administrators, support staff, and community members related to the implementation of the one-to-one device initiative.

RQ1: How does implementation of a one-to-one initiative occur in a rural school district?

RQ2: What factors influenced the implementation process?

RQ3: How did the views of stakeholders influence decisions in implementing a one-to-one initiative?

In this chapter, I discuss the setting where data were collected, how data were collected, and the demographics. I also discuss how data were analyzed, present a detailed description of each phase of the study, describe the evidence of trustworthiness, and discuss the results of the study.

Setting

During the Winter Quarter of 2018, I petitioned the IRB at Walden University for approval to collect data in a rural school district in Mississippi. The approval was granted during that quarter (approval number 11-06-18-0129290). The school is located in one of 151 districts in Mississippi and ranked in the top five academically. There were approximately 4,230 students in the district and about 1,200 attended the high school where the study took place. The high school had approximately 80 teachers and four administrators.

The high school was built before the one-to-one initiative was implemented. However, each classroom came equipped with an Apple TV. Depending on the setup of the room, the classroom was equipped with either a 70-inch television or data projector with screen for presenting instructional content and/or demonstrating student learning. The campus consisted of seven different buildings with each building housing either the math, science, history, administration, language, cafeteria, or athletics programs. Each building was two stories except the cafeteria and athletics building. The campus covered more than 30,000 square feet of learning space.

The high school is located in a northern county in Mississippi. According to Health Resources and Services Administration (2018) and data from the U.S. Census Bureau (2016), northern Mississippi is a rural area by definition. The U.S. Census Bureau defines rural areas as all territory, housing units, and locales of a town or city that have not been defined as urban. This definition of rural has been consistent in Census Bureau history since the early 1900s (U.S. Census Bureau, 2016). Children living in rural areas had higher instances of lower median income compared to those living in urban areas but had lower rates of poverty. They were also uninsured at a higher rate than those living in urban areas (Health Resources and Services Administration, 2018).

Rural areas had more owner-occupied homes, but the adults obtained a bachelor's degree or higher at a lower rate than those in urban areas (U.S. Census Bureau, 2018). The state with the lowest rural median household income was Mississippi ($40,200) according to American Community Survey (U.S. Census Bureau, 2015). Urban areas, as defined by the Census Bureau (2016) are blocks that have a population density area of at least 1,000 persons per square mile and surrounding census areas that have an aggregate density of at least 500 persons per square mile. The population density for the rural county in Mississippi was 75 persons per square mile (U.S. Census Bureau, 2018). Table 2 provides data about rural Mississippi from the Census Quick Facts (U.S. Census Bureau, 2018)

Table 2

Rural County in Mississippi Census Quick Facts 2013-2017

High school graduate or higher, % of persons age 25+	89.5%
Bachelor's degree of higher, % of person age 25+	41.9%
Percent of persons with health insurance, under age 65	7.4%
Civilian labor force, % of persons age 16+	58.9%
Living in same house 1 year ago, % of person age 1+	74.0%
Percent of owner-occupied housing units	58.4%

Participant Demographics

All participants in this study worked at a high school located in a rural county in

Mississippi. The participants were teachers and administrators. In total, my research

included nine participants. I had originally planned to have two teachers from each

academic discipline and stakeholders from the PTA, but that did not go as planned. I had

one special education teacher, two science teachers, one language teacher, and one

elective teacher. I had no teachers from the history or math disciplines and no community

stakeholders from the PTA who volunteered to participate. I had one teacher and one

parent who consented to participate in the study, but later decided not to participate. The

sampling was purposive and designed to recruit participants from a specific populace

who were present during the implementation of the one-to-one device initiative.

Unfortunately, due to the time frame of the beginning of the implementation and start of

data collection, the participant pool had narrowed as the result of prospective teacher

participants no longer working for the district. Consequently, the final sample consisted of nine participants.

All nine participants were either teachers or administrators at the beginning of the implementation process of the one-to-one initiative for the high school. The participants possessed a varied degree of knowledge of technology and its use in the classroom. Some had prior use and others had very little. The administrators' knowledge of technology was comparable to the varied levels of the teachers. The participant's experiences in their identified role spanned from 3 to 25 years. All four administrators had previously taught in the school district where the high school is located.

Both individual and focus group interviews were open to all participants. Participants were at liberty to participate in one, both, or none. The selection process was a part of the electronic consent form sent to teachers and administrators. In an effort to protect the identity of all participants, I referred to them by pseudonyms. The information in Table 3 indicates the pseudonym used, whether the individual participated in an individual or focus group interview, their current role, and years of experience in that role.

Table 3

Participant Demographics

Participant	Pseudonym	Interview type Individual = I Focus group = FG	Role Teacher – T Administrator - A	Years working in current role
Participant 1	Theresa	I	T	15
Participant 2	Kate	I	T	9
Participant 3	Mary	I & FG	T	16
Participant 4	Sheila	I	T	7
Participant 5	Amy	FG	T	10
Participant 6	Harold	I	A	7
Participant 7	Helen	I	A	5
Participant 8	Martha	I	A	25
Participant 9	Bill	FG	A	3

Data Collection

The data collection process involved the collecting documents and conducting interviews. Table 4 indicates the type of data collected. The documents collected were survey data from parents and students, professional development schedules for teachers related to the device implementation, school board minutes, and local newspaper archival data related to community involvement and the timeline of implementation. The interview recruitment process was more difficult than I had originally envisioned. I was approved by the IRB to collect data during the Winter Quarter of 2018. Unfortunately, this time of year was hectic for the rural high school. The holiday break was coming up and teachers were preparing for semester exams. The high school administrator was not able to schedule a time for me to meet with teachers as soon as I had anticipated as a result of the time of year. Additionally, I had to send the email invitation to the high

school administrator twice before I received a response to meet with teachers to explain the research and how the electronic participant consent agreement worked.

I finally met with the teachers and explained the study and answered the questions that were posed. It was equally difficult to contact and schedule a meeting with the PTA. After the meeting was scheduled with the PTA, only one parent consented, but that parent never responded to schedule the interview. It took 3 months to schedule the first interview. After waiting for the holiday to pass, the rush of spring testing and spring break hurriedly approached and posed another setback for interviews. Finally, after spring break, I was able to schedule interviews. I conducted seven individual interviews and one focus group session that lasted approximately 45 minutes each. Two of the individual interviews were conducted over a speaker phone system and the rest were conducted face to face. All interviews were recorded using a voice recorder application.

Table 4

Type of Document Data Collected

Individual & focus group interviews	Board meeting agenda, minutes, & attachments
Professional development schedules for teachers & administrators	Parent surveys
Student surveys	Local newspaper archival data

Data Analysis

Data collection and data analysis were conducted on a staggered basis due to me being the sole transcriber of data. There were times when I transcribed and analyzed during the same session, and there were times when I transcribed and analyzed the

transcribed data at a later time. I kept a reflexive journal (using Word) during data analysis to record my thought process as I discovered thematic patterns during the analysis process. The process of reflexivity kept me aligned with the thought processes and patterns that emerged relative to the data and conceptual framework of the study (Srivastava & Hopwood, 2009). I used varied steps for coding that included (1) organizing data by research question, (2) color coding responses relevant to specific research question, (3) extracting thematic structure from the responses and document analysis, (4) using Excel to organize thematic structure by research question, and (5) then looking at the data as a whole (not segmented by interviews) by research question to see if the themes were consistent throughout the process.

I used two additional post-doctoral persons to review the transcripts with color coding, without any thematic structure present and without any identifying information present and explained to them the coding process. I then asked them to identify what they thought were the emerging themes to test the consistency of my coding and theme development. Their themes were consistent with those that I developed. This was done as an extra measure to further support the credibility of the thematic structure.

I used ©Microsoft Word and the technique of line by line coding; however, I did not use NVivo as previously planned during the proposal stage of the study. Microsoft Word was used to transcribe interviews and color code data that were related to the interview question asked, and I did not color code unrelated data. I left it to be revisited later to determine if the data were truly discrepant or answered other questions asked in the interview process. After color coding the data, I used Excel to look at each

participant's responses by interview and research question. I recorded the categories that developed individually based on responses by each participant. Then, I went back and reviewed the categories to look for similarities and that is when the thematic structure began to emerge. However, after organizing the emerging themes, I noticed there were data that did not connect to any of the themes that emerged. I treated these data as discrepant data to be addressed as possible areas of further study. Table 5 shows how the codes were combined into categories and themes.

Table 5

Codes, Categories, and Themes

Research question	Codes	Categories	Themes
RQ 1: Implementation	Tech coaches Need for continuous training Inservice training Summer training Needed more up front training Minimal training Not enough time invested prior SAMR training Required tech training Tech training requirement dropped Wrong focus of training Training needed more on using tech to teach, not just tech Learning from each other/on own	Tech coaches Training needs Training requirements	Professional development
	Administrator communication Power School to communicate grades/assignments to parents LMS to communicate assignments to students Data used more Used email more to communicate with students/parents More productive parent communication More timely responses Parents can see grades online Data from tools useful in identifying student needs Immediate statistics Improved student feedback Good way to get information from students Too many tools to communicate Some parents no access to internet Parent frustration with too many tech tools to communicate	Better student feedback Improved parent communication More access to information Communication frustrations	Communication/feedback
	New ways to engage students Discourage from playing games Mitigate device distractions Training new students on tech Using classroom instruction time to download assignment to accommodate students with no Internet Mitigate cheating using devices Device a distraction to instruction Lockdown browser due to reduce cheating on devices Need to understand class dynamics with tech Not all students comfortable with tech Struggle to keep students on task New plan for tech discipline referrals	Device distractions Plagiarism/cheating Changed class dynamics Accommodate student needs for access/training	Classroom management

Research question	Codes	Categories	Themes
	More project-based instruction Flipped classroom Teachers more creativity Use of LMS No paper/restricted paper use Move to electronic assessments Change from Microsoft to Apple Mandated technology use in instruction Technology in lesson plans	Changes in how teachers delivered content Changes in student assessment Changes in teacher technology use	Instructional practices
RQ2: Influencing factors	Need for front end training Teachers not early adopter Teachers felt unprepared for the implementation Teacher struggled to find balance between technology and traditional instruction Minimal discipline focused tech training Fear of computer Tech seen as not relevant Not enough time to learn before students given devices Students know more than teacher about tech	Feeling unprepared Need for different and more PD Tech not relevant	Teacher readiness/efficacy
	Teachers were at different readiness levels Administrators viewed the implementation as a way to get students college and career ready Admin belief students were excited to learn with technology Sufficient training provided before implementation Provided tech support Outside consultants used Alignment with district plan Teachers needed more direction using tech to teach Inconsistency across classrooms Teachers with no clue Measuring teacher tech levels Longer than thought it would take Teacher closed mindset Importance of tech access	Training and support provided Teachers at different levels Inconsistency in implementation Importance of tech	Administrator views
	Students need a variety of ways to learn Finding ways to reach special needs students Student deficit in device usage More remediation needed for special needs students Student had more accessibility to content outside of the classroom More training needed for students on digital citizenship Need for access to charging Disadvantage for poor parents Need for student training in more than device safety	Differentiated student needs More accessibility outside of school Need for training	Perceived student views

*(table continues)*

Research question	Codes	Categories	Themes
RQ3: Stakeholder views	Redundant training Not what teachers needed to know Teachers not consulted Teachers just told what to do Teachers had no say Forced to use tech as paper was limited More teacher input needed Needed department feedback Unilateral approach Some teachers on committee Forced to use - no option	Top down decisions No choice or input	Lack of teacher Input
	Parent need for tech training Frustrated with process Inconsistencies in understanding Student work overload at home on device Parent access to student information Some parents left behind with tech Open forums held Community both positive and negative Educating for the future Can continue to learn when sick Cannot find assignments	Some parents left behind Overload at home Both positive and negative views	Community perceptions
	Most like tech Some want textbook instead Some learn best with books Transfers in had difficulty adapting Should not have to pay if don't want to Felt forced to pay tech fee Paper is faster Struggle with navigating to find assignments Different expectations from teachers Mixed readiness levels Training needed	Some prefer paper/text Adapting to new school Frustration with teacher expectations Forced to pay	Perceived student views
	Planning was not adequate Units were not funded to support learning with tech All stakeholders were not considered Financial burden fell on families for technology fees Wanted to use the implementation to change instruction Real goal of implementation was not properly communicated to teachers and principals Admin lacked training and rarely used the devices Training did not trickle down to classroom Board leaders in initiative Researched other schools Lots of training provided Ownership in decision process	Need for better communication and support Owning the project Financial impact	Administrator Perceptions

The themes that develop during data analysis were professional development, communication/feedback, classroom management, instructional practices, teacher readiness/efficacy, administrator views, perceived student views, lack of teacher input, community perceptions, perceived student views, and administrator perceptions. Figure 1 provides an overview of the themes identified in response to each research question.

Figure 1

Overview of Themes
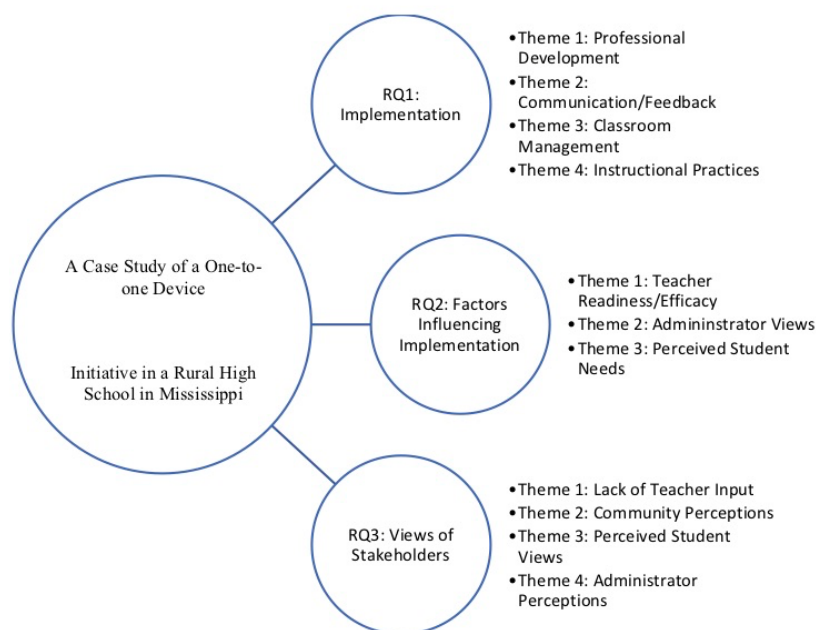
During the document analysis process, I took the survey data from students and parents, looked at the areas addressed on the survey questions, and then read through each response to see what themes and patterns emerged from the questions when paired with the responses. The other document types were professional development schedules with focused topics, newspaper clippings, and board minutes related to the administrative

processes of the one-to-one initiative. The school board minutes were more difficult and time consuming to analyze. The school district used Board Book which is accessible publicly online. I did a Board Book search using keywords: *Macbook, one-to-one, Schoology, student surveys, parent surveys, professional development, Apple, and implementation*. The Board Book search did not produce productive results; therefore, I had to conduct a manual search. I had a general idea of the time frame of the implementation and started searching in year 2014 looking through each board agenda to see if any information about the one-to-one device initiative was present on the agenda. If relative information was present on the agenda, I searched further by opening attachments and reading the minutes associated with the board meeting. I searched years 2014 – to the beginning of 2016. I noticed there was no more relevant data after December 2015.

Evidence of Trustworthiness

The nature of qualitative research compels the researcher to follow established and acceptable protocols to protect the validity and reliability of qualitative research (Lub, 2015). Maxwell (2012) stated that validity is relative and must be measured in connection with the circumstances and purpose of the research. Therefore, content validity is contextual in qualitative research, depending on the type of setting necessary to conduct the research. Additionally, it is important to scrutinize every phase of qualitative research including preparation, organization, data collection, and reporting of results (Elo et al., 2014).

Credibility

The qualitative researcher can use various strategies for credibility checks during the data analysis process. Credibility is essential to the research process because it speaks to the trustworthiness of the study. Additionally, credibility deals with the focus of the research and how well the data addresses the focus of the research (Palinkas, et al., 2015). I used the strategy of triangulation to improve credibility of this study by using multiple data sources, two additional reviewers of data, and participant validation (member checking) by contacting participants to validate understanding of their responses. Additionally, I spent months in the data collection process which assisted me in understanding the unique culture of the rural school. I also used reflexivity by disclosing personal biases or assumptions I had relative to the research study by keeping a reflexive journal as recommended by Maxwell (2012).

Transferability

The transferability or reliability of the study is concerned with what degree a study can be replicated and get the same results. In qualitative studies, the unique experiences of individuals are used to capture the meaning of a phenomenon. Therefore, it is difficult to create a benchmark that similar studies can use to get like results. Human experiences are not static across settings and situations (Merriam & Tisdell, 2016). As a result, this study may not transfer to other settings, but may be used to provide insights into the successes and barriers to implementation of one-to-one devices in rural school contexts. To enhance transferability of a study, Merriam and Tisdell (2016) noted that providing rich, thick descriptions of the setting, participants, and findings of the study

allows readers to draw conclusions of applicability to other situations.   Shenton (2004)

described similar strategies as Meriam and Tisdell (2016) for enhancing transferability in

qualitative research. For this study, I provided detailed descriptions of the context in such

a manner that the reader could determine whether or not the findings may be applied to

their environment. I also disclosed the criteria for selection of the participants and

provided the unique characteristics of the participants, relative to the study, so that

transferability to other contexts may be determined by the reader, as explained by

Palinkas, et al. (2015).

Dependability

Dependability refers to the consistency of data over time and under various

conditions (Palinkas, et al., 2015). It measures the potential for alignment between two or

more independent people about the relevance and accuracy of the data. Therefore, the

important question concerning dependability is, will the findings of this study be

replicated if it were conducted using like or similar participants in the identical context?

The strategies I used to enhance dependability included triangulation through multiple

data sources that included individual interviews, focus group interviews, and document

analysis. I also used intra-rater agreement (also known as the code-recode process) and

used the triangulation method described in the analysis section above. Simultaneously, I

maintained an audit trail that documented the study's process and my decisions during

the study. The audit trail consisted of an unstructured journal I used to catalog my

thoughts and processes during the interview process to the analysis process of coding and

recoding to ensure a consistent thematic development based on data collected.

Confirmability

In qualitative research, confirmability refers to the objectivity of the study and how well the researcher's findings can be validated by others. It is imperative that the researcher takes the necessary steps to ensure, as much as possible, that the findings are the direct result of the experiences and perceptions of the participants, and not the preferences of the researcher (Yazan, 2015). Conclusions must be based on data and not biases or assumptions of the researcher (Yin, 2011). Additionally, Yin (2011) posits that it is impossible to alleviate all of our human emotions and feelings in a study, but one must keep the reflective self under control. To address this, I kept a reflective journal and disclosed my predispositions and potential biases. This will be discussed further in Chapter 5.

Yin (2011) also suggested a colleague check of the writing to ensure that the conclusions were supported by empirical evidence. I used the colleague checking technique, suggested by Yin (2011) as another assessment of confirmability. During this phase, I used the same two reviewers, who were familiar with the data, to review the findings of the study. I also used member checking to strengthen confirmability of this study.

Results

As presented in Chapter 2, the literature described positive relationships between student engagement and mobile technologies in the classroom, but also disclosed the mixed perceptions of teachers concerning technological device implementation and use. The teachers felt overwhelmed with the implementation process, and they communicated

their frustrations concerning their lack of preparedness for the use of the devices in the learning environment. These perceptions directly impacted the methodology and rate by which teachers implemented the devices.

For this study, I analyzed the results aligned with the three research questions presented. I structured the interview questions for the individuals and focus group to be aligned with the research questions. Additionally, I structure the data analysis questions to be aligned with the research questions. I used research questions to structure and present the findings of the study in this section. The results are presented next by the research questions. Figure 1 provides an overview of the themes identified in response to each research question.

Figure 1

Overview of Themes
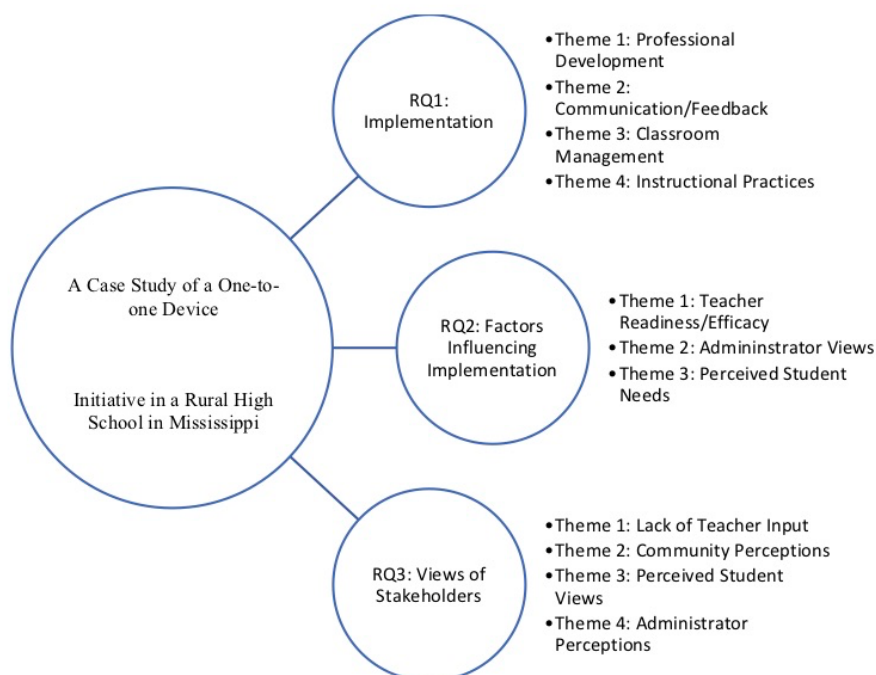
Research Question 1: Implementation

The first research question was constructed as follows: *How does implementation of a one-to-one initiative occur in a rural school district?* The question explored teachers' and administrators' perceptions, as well as school board policy, related to the actual process of implementation of the one-to-device initiative. The device of choice for this school was the MacBook Air. The themes that emerged from the data were (1) professional development, (2) communication/feedback, (3) classroom management, and (4) instructional practices. The participants shared their experiences in the data below.

Theme 1: Professional Development

The first theme is related to the need for and importance of training prior to implementation and during implementation. Participants perceptions were varied depending on whether they were teachers or administrators during and after the implementation process. Also, the population (relative to teaching students with exceptionalities and students with no exceptionalities) of students served, in conjunction with the subject taught, produced varied perceptions on professional development before and after implementation. The consensus among the teachers was that they did not receive the training they felt they should have had to prepare them for the implementation. Some felt more training was offered after the implementation started. On the other hand, Martha and Harold (administrators) felt adequate training was available and provided before and after the implementation, while Helen and Bill (administrators) did not. All agreed that there was a need for training before and after implementation.

Helen, an administrator, stated:

I wish that we had done the training differently. I think that we had some training

for teachers, and I think they were minimal. Just because of the time factor…we

were all pushed for time. I think it was announced the previous semester before

the rollout (device implementation) that this was gonna happen. And since

everybody felt, I think, a little just pushed for time, when it came to the training

process, very little was done ahead of time that was truly beneficial to the teachers

and for the students and parents.

On the other hand, Harold, also an administrator, revealed the following.

We hired two instructional technologists, at the district level, so that those

individuals could work with teachers on things they wanted to do. Of course,

initial training was provided. You can always do more. In an infinite amount of

time you can always do more. I do not know that we have met the goal that we

had at the district level, which was more problem-based learning, interactive

problem solving, real world problem solving as opposed to taking an online test.

That is certainly technology but that is only part of what it can do. We provided

training for teachers to help with learning the SAMR model (substitution,

augmentation, modification, redefinition) and implementing that model using the

devices as a support for learning, but I do not know how much of that training

actually trickled down to the classroom. Clarity can certainly be a factor when

communicating district level goals to schools. I think the training staff

(instructional technologists) understood the district's goals. I also think just like

today we have teachers at varying degrees of readiness for that. So, I think what

quickly happened was the focus shifted to helping those get to a minimal level of

understanding rather than getting way up on SAMR model.

Martha, another administrator, stated:

There were three district level goals/policies related to the implementation. They

were student achievement, equity, and high-quality professional development.

Those were our three main goals for the one-to-one initiative. But under that,

there were certain objectives related to the district's vision, goals, and strategic

plan (policy) and we had a timeline for all of the professional development broken

down by years from 2015. We did 15 hours of technology training the first year

for teachers and administrators and the next year was 30 hours. We partnered with

some outside consultants and then we had our in-house professional development.

So, we felt like we had high quality professional development.

The data from the professional development documents communicated training

topics, training times, and numbers of technology hours earned for specific trainings. The

data collected from document analysis aligned with the interview data collected during

Martha's interview. The documents revealed the number of technology hours approved

by the school board to be implemented as a part of the one-to-one initiative. During the

first year of implementation (2015), each certified employee had to complete 15 hours of

technology related training, conducted by the technology coaches in the school district.

Document data also revealed the topics and times for each training for implementation

years 2015 - 2016.

The teachers had a different perception than that of Martha's and Harold's. Kate stated:

> So, there was definitely, I feel a whole lot more training after the implementation than before. We would have to go. We had these technology hours that we had to accumulate for the year and those were usually related to the Apple product some way. You had to like master a skill provided by the Apple product. I spent summers going to get certified in various capacities for the Apple product. That was really heavy after implementation. Before implementation, I can't really recall very much.

Additionally, Mary taught students with exceptionalities and felt that the process was not as simple for her students. She became, not just the implementer of the technology in the classroom, but the actual technology teacher. She also felt unprepared for the implementation process. She stated:

> Yes, I did attend several trainings during the summer before one-to-one initiative on how to use certain programs on the computer for utilizing the services we provide here at the school, such as how to use a grade book or how to use certain Microsoft programs or Google programs to prepare me for the laptops and one-to-one initiative items. After the one-to-one initiative started, I felt like it was more of trainings were offered and you had to seek out or apply to go to the training, and I did conduct some training and apply to go to some. Many times, training was also provided during professional development, but many times I felt like I wanted to learn on my own - me actually going into whatever that was provided

and kind of playing around with it myself. I worked in the high school, and I work with the exceptional students. I find that grade level wise, we are not quite on the grade level as many of the students in the building and so some of the material wasn't age appropriate, or I myself as a teacher, would have to go back and actually teach students Intro to Technology in order to have the students participate in many of the programs that we were taught to use in the classroom.

Theresa's account was similar to Kate's and Mary's, but she provided a much deeper look into the actual training that she personally felt she needed as a teacher to make the implementation process better for her and her students. Theresa and Sheila mentioned the varied technology online platforms, such as PowerSchool and Schoology, that were components of the implementation process. Theresa's experience is stated below.

> We all received—the teachers—we all received Macbooks a year or two, I cannot remember, before the students got theirs. We knew it was coming. We were told that we would eventually go one-to-one with Macs and they wanted us to be familiar with the devices. Now I remember, it was 2 years before the schoolwide implementation at the high school. We really did not receive formal training. We were told that we could pdf just about everything and that we also be using a learning management system when the implementation took place. There was just too much going on at the same time. The students got their computers and we had to use Schoology which we received some summer training on how to use before the school started that year. So, over the summer before the kids got their devices,

we were told we had mandatory training on Schoology. We had no say, well some

did, but not all and not me. When the kids came back, they wanted us prepared for

them and wanted us to wean ourselves off of paper use, so Schoology was not

really an option. The principal gave each teacher a counter limit for paper, so we

really had to use Schoology to keep from reaching our counter limit and not be

able to make copies. I know I am going the long way around, but we received

some training on what software (like pages, keynote, and numbers) that we would

use so that we could help the students learn how to use it. We received some

training on how to put documents and tests in Schoology and how to setup grades

in Schoology, but we still did not have what we needed to really facilitate learning

with the one-to-one platform. Now, after the implementation, the tech coaches

made themselves available and the school district mandated that we get 30

technology hours of training each school year and that was hard because of our

busy day. Needless to say, that did not last long. We do not do that anymore.

When asked about the specific training they were offered, Theresa said:

Well, we got training on online things like wikis, blogs, Canvas, Prezi, and Go

Animate. Most of the trainings were led by teachers who were overachievers and

had learned these tools on their own without training. We also got introduced to

Garageband, Quicktime, and MovieMaker. But the training we needed most was

how to teach or support learning using those things and we did not get that. We

felt our way through, and many issues came up.

There were some who had different experiences, during the implementation phase, with professional development. Sheila recalled the following experiences.

That first year of training was only related to PowerSchool (a student management system). How to put grades in how not to put grades in. Meet you Macbook like basically, how the teachers need to use a Mac computer. Cause we had Mac computers, but the kids didn't at this time. The trainings focused on the Mac version of productivity like Pages vs Word, Keynote vs PowerPoint, and Numbers vs Excel... those kinds of things. So real basic level, entry level, how to use an Apple computer, how to use PowerSchool, and how to take a test on Schoology.

The focus group consisted of two teachers and one administrator. The group reiterated similar findings of the individual interviews. All three of the teachers stated that little training was done before the implementation relative to how the process should look in the classroom. Prior training focused on getting to the device and the preinstalled software that came with the device (MacBook). The group agreed that more training was available after the devices were issued to teachers and after the students received theirs. Amy recalled:

Much of the training before was professional development where we talked about more moving toward the technology (device usage). After we moved to one-to-one, there began to be more professional development opportunities for teachers to piggyback off other teachers as far as using one on one to learn different things related to technology. The only really specific training I remember, that's fresh on

my mind, is flip your classroom. That's the one that stays clear to my mind. That was when the district brought in this former history teacher, that supposedly developed the idea of flipping your classroom. All of us were not a part of that training. Teachers were selected as cohort trainers and they were expected to use it and train the rest of us. But that training did not take place as promised, and we were left to figure it out on our own like many times before.

The perceptions of the administrators were slightly different from that of teachers (revealed in interview data) and community members/parents as revealed in the surveys reviewed during document analysis. The parents revealed some frustrations with the implementation process in the areas of student work overload using the devices and a very inconsistent method for helping students understand how to navigate Schoology to do their work and PowerSchool using the devices.

Theme 2: Communication and Feedback

Communication and feedback among the stakeholders were found to be an important part of the implementation process. Most participants shared that communicating with students and parents became much more productive and much easier to do during implementation than before the one-to-one device process began. The types of communication and feedback mentioned were the increased ability to email parents and get a timely response, the ability to communicate assignments ahead of time using PowerSchool (electronic student management system), the ability for parents to see grades as soon as they were posted by teachers, and the ability for students to receive

immediate feedback from online assessments using Schoology (learning management

system). During the focus group session, Bill stated:

> The feedback for me, using Schoology, was really nice. So, we could actually
>
> open up the quiz or test the students took in Schoology and see which questions
>
> they missed the most. The immediate feedback gave you an idea, in statistics
>
> form, which ones were missed the most and helped indicate where I needed to
>
> focus to help my students. We could go over the questions that were most
>
> troublesome. Again, the students could see what they needed to work on
>
> themselves before another assessment or test. The time it takes for Schoology to
>
> provide that feedback is much less than the time it would take me manually
>
> grading and writing.

Mary added to the conversation to lend some understanding as to how the device

implementation in conjunction with the feedback opportunities has impacted how her

students with special needs are supported in this area. She stated:

> That's awesome, too, for us because a lot of times and we can see what our
>
> students missed in Schoology and we can say just study this because their
>
> attention span is very short anyway and they can go back and look at what they
>
> missed and take that uninterrupted time to focus on specific questions or areas
>
> that will really help them.

Kate and Sheila explained similarly how the ability to give and receive instant

electronic feedback transformed the way they communicated academic performance to

their students. Kate stated:

One of the biggest things I feel like is that on demand feedback and its

instantaneous. I can decide in a few minutes what I need to work on with my

students because of the ability through Schoology for them to take online

assessments, and I can view the results in graph form by each question. I also

used Go Formative and that was very successful in informing instruction and

allowing the students to exercise their skills and learn from their mistakes before a

summative assessment was given. So, it not only informed instruction, but it

informed learning. Without the one-to-one, it would have been impossible to do

this this way. I used Google surveys to inform instruction and this especially

proved successful with students that were shy and afraid to raise their hands but,

did not mind communicating using an anonymous survey or polls to communicate

their learning or ask questions about the items they don't understand. This was

extra layer for me to help them become better.

Although, the majority of participants expressed a positive attitude about

feedback and communication relative to the implementation process, Amy revealed a

contrasting element that she viewed as an impediment to the process when

communicating with some of the parents of her students. Amy stated:

One thing I will say, also, is I think because of this implementation change our

parents have a hard time keeping up with what we are doing online. You have

PowerSchool and then you have Schoology. PowerSchool is for the grades, and

Schoology is for the assignments and other things. Then you have other options

you can do as well but a lot of them have a hard time keeping up with what their

child is doing and their grades because of the technology. That is a difficult situation for a lot of them. So there probably should have been more intense training for parents, and availability for them to come in and receive training because many parents still today will say I do not use a computer, or I do not have an email address. So, they have been left behind and it is frustrating. They do not know what their kids are doing until they see progress reports when they bring one home, because they cannot and do not use the technology to get those updates. So, for the who parents can and do use technology, it has been great for both teachers, students, and parents. But for the parents that do not use or know how to use it, it is another barrier to communication and them getting feedback about their kids.

Overall, communication was seen as critical for adequate implementation and a benefit some believed resulted from the implementation, was improved communication. However, others felt the implementation added a communication barrier for some parents who were not proficient with the technology and given the fact that parents were not offered training. The parent surveys did not clearly reveal the types of communication barriers that were experienced by the parents/community members but did disclose conflicting views across some responses. Some parents felt that Schoology and PowerSchool were great sources of transparency to help bridge the communication gap experienced with communicating grades and assignments before the implementation.

On the other hand, the survey data revealed frustrations with the electronic communication process. The survey data did not clearly reveal the level of proficiency

that each parent participant possessed using technology. Some parents/community members left comments about not understanding how to use the technology to check grades and keep up with their child's assignments. Both survey and interview data revealed some successes and frustrations in the area of communication from the perspective of teachers, administrators, and parents.

Theme 3: Classroom Management

The third theme, classroom management, is about the need for teachers to not only receive training on how to use the technology and appropriate pedagogical approaches as evidenced in theme 1, but also to understand how the classroom dynamics change and how to manage a classroom with one-to-one devices for students. Teachers needed a better understanding of how the tools might be used and how to manage the less positive aspects of classroom behaviors that might result. Participants reported unpreparedness and lack of administrative support when managing device use with task-oriented activities in the classroom. The consensus among teachers was that students were able to cheat more and disguise their learning by submitting digital assignments that they did not do themselves. Participants reported that there was no system in place, from the onset, to curtail this type of plagiarism; therefore, teachers struggled to mitigate it and administrators had more discipline problems to deal with, with no real consequences that would have beneficial long-range effects. Trial and error was the process used to deter cheating using technology. Additionally, teachers reported difficulty with keeping students on task due to what they perceived as an instructional distraction (playing games online during class). Theresa also revealed another barrier for classroom management.

She mentioned receiving students during the year who had no prior experience learning using devices was as equally disrupting to the flow of class as navigating through cheating with online devices. She stated:

> This platform created an environment for cheating that you would not believe. Students shared pdfs of assignments with each other and submitted the same assignment. Little things like forgetting their device or it being dead when they got to school posed issues or when it stopped working and there was no replacement they got behind. Here is another…getting a student in the middle of a semester and having to teach them how to use the device and the programs and Schoology was horrible. It took too much time away from other students. We should have had an orientation process for new students from the beginning. Managing those things were very distracting and time consuming for the teacher and the student.

Kate provided a similar account but provided an insightful picture into her experiences concerning classroom management using the one-to-one devices. Kate stated:

> So big, big challenges! It became a lot easier for the kids to be academically dishonest, you know, things like using Airdrop and email very accessible to everyone. That even changed with cell phones prior to the one-to-one. That was something we definitely had to modify and adapt to figure how to disable Airdrop so kids could not Airdrop assignments. When we went to online assessments using Schoology, we had to figure how to lockdown the browsers so kids could

not go on to the Internet and cheat during the assessment. So, those were some

challenges that we faced initially. I think there was also huge amounts of

distractions for the kids at first. They were able to play games for the first time in

class and a lot of teachers went to substitution of paper with the computer. So

really the level of what the kids were doing in the classroom was not that

engaging; you know it was just substituting paper, so it was hard to keep their

attention until you just figured out a way. So this would be one of my successes to

figure out a way to make the instruction a little more engaging, meaningful and

get to a deeper level using the technology and engage them in a way where they

did not want to play a game and they did not want to be looking at movies. That is

all across the board; you still run into some of those issues, but I definitely think

finding ways to minimize distractions was a challenge for sound classroom

management. So, the ability for me to become creative helped me with managing

those distractions with the technology.

Amy echoed similar challenges with classroom management using the devices. She

stated:

The computers are not as restricted as I think they should be. The students able to

open up a lot of things that they should not be able to have access to, and they get

sidetracked and do not pay full attention. Even though we do have laptops,

personally, I make my kids take their notes on paper because I do not want them

to have all their notes on the computer and have to use it all the time, and I like

them taking notes on paper. That is one of the challenges. For a teacher like

myself, getting them to stop trying to use ©Google Translate has been a pain in

the bottom honestly. They do not want to learn material. They look for an easy

way out. They will not actually learn what they are supposed to be learning to be

able to succeed.

Mary expressed frustrations as well. She said:

For me, I think the challenge definitely was as she mentioned…getting kids to

stay on task because when it is just a book and paper in front of you, you have got

one choice, do the work, or if you are off task it is going to be obvious. Kids were

so slick; when we first put up the pdfs, and you think they are reading, but they

could easily with a swipe of finger go get on a game for a second or check an

email. So those distractions and making sure you found ways to be vigilant was

definitely a challenge.

Theme 4: Instructional Practices

Instructional practices were viewed by participants differently depending on their

role in the implementation process. The teachers' role was more clinical and practical;

whereas, the administrator's role was ensuring that instruction could take place with as

little disruption by the implementation process as possible. The teachers discussed how

they had to change their teaching practices during implementation and administrators

discussed the need to change some administrative practices as well. Theresa, a teacher,

stated:

Today I can truly facilitate. I flip my classroom a lot, and what I mean is I will

push videos to them using Schoology to watch that will prepare them for activities

that we would do next day or following days. I would allow them to download the videos at the end of class because not all kids had internet at home. If they were struggling with a concept, I would pair them with a Khan Academy video, and I could keep moving forward and monitor their progress as well. This was not possible before the one-to-one initiative. It took a lot of practice, but I used technology often before the initiative started in our school.

Helen offered a unique glimpse from the perspective of an administrator concerning how Wi-Fi access at home affected instructional practices in the classroom. Helen stated:

One of the issues that affected instruction was, of course, Wi-Fi access. We found that a significant portion of our population did not have Wi-Fi access at home. That is still a barrier that we are working to overcome four years later. We had to do a lot of things differently when it came to teacher instructional expectations. For example, teachers could not require that an assignment be submitted by midnight if the student did not have Wi-Fi at home. Students had to be allowed time to submit assignments the first few minutes of class to accommodate for the lack of Wi-Fi access at home. Also, I think that any time you implement something it is always good to give teachers the opportunity to work up to it in their face 24/7 every day. So, teachers know how or what classroom management looks like using computers. So, that they would have practical applications of things that they can do with those computers, so that would not be seen as a nuisance and certainly not seen as a distraction, because students are just playing

games during the lesson. Just that sort of thing. When something becomes too much of a distraction, it produces discipline referrals. We had no action plan for playing games. We had to spend time developing an action plan for discipline referrals related to improper technology use. We wanted to use the technology to transform learning, not spend our time responding to technology related discipline referrals. It takes a lot more training to really utilize technology to transform instruction and learning.

Sheila described her journey as a process of learning to use a mixture of instructional strategies to best meet the needs of her students using technology. She mentioned how her practice evolved over time. Sheila stated:

That was the hardest challenge we faced originally was creating authentic assessments and assignments. I realized that more and more my things needed to be authentic, assessment needed to be more authentic, materials needed to authentic. It should not be something you could just find anywhere. And so it caused me, that second year especially, to switch things from just plain copies that I used in the past to more authentic copies, things that I had done myself, materials that we had created as a group in our PLCs and things that were not just DOK1, but more application, which is a good technique to have anyway. It moved me better and more in that direction. The most success that I had was in the past, if you had a low student that was absent, and they were not able to get there early in the morning; and they were not able to stay late. There was not a whole lot of time to come during the day. And so one of my biggest successes was that

anything they missed, they had access to, and if they did not like the way I explained it or if there was not necessarily a clear way for me to get them that exact material, I could give them a link or webpage that they could access or could go to, and they did not have to miss an assignment, if they missed class. The one-to-one initiative allowed the student be opportunity to keep up even in their absence. I could offer remediation remotely through providing asynchronous or synchronous videos if needed.

Mary teaches students with exceptionalities and she found the use of the devices with accessible technologies to be quite beneficial to her students and her instructional practices. Mary stated:

This year is the first year I am actually able to get away from the textbook. The technology allows me to use a lot of real-life applications because that is what my kids really need. Also, we are able to use a lot of animated stuff inside the classroom - for example in learning to use the ATM, you can actually use the ATM on the computer with animation. I had many of them that do not know how to use an ATM machine. This brings practical life skills within reach for my students.

Overall, the participants indicated that teachers and administrators need to consider how instructional and administrative practices may need to change as a result of implementing a one-to-one device initiative. Considering these things in advance may help teachers and administrators navigate the change process better.

Research Question 2: Factors Influencing Implementation

The second research question was constructed as follows: What factors influenced the implementation process? The question explored the participant's perceptions concerning the components that influenced the progression and or digression of the implementation process. Several categories emerged from the data that led to the development of each theme. Participants shared their unique experiences related to (1) teacher readiness and efficacy, (2) administrator views, and (3) student need. Participants shared how these factors impacted the implementation process.

Theme 1: Teacher Readiness and Efficacy

Participants shared varied views on the readiness factor of teachers versus the lack of training they felt played a role in how comfortable or accepting teachers were to the implementation, and the processes that came along with it, in the classroom. The more prepared teachers felt, and the more efficacy they had regarding their own use of technology, the easier the implementation process felt. The less prepared and less comfortable they were, the more challenges they perceived. Amy felt that minimal training in her subject area, relative to technology integration, caused her to adopt much slower than she would have if she had been better prepared for the implementation process. She shared the following.

> I would like to see something closer to my subject area. Usually it is core subjects that training is based on, and I would like to see something for what I teach and can use in my classroom that really applies to me and my kids. I would have to say that more intense training was needed for our specialty areas, because I felt

just like students; teachers learn differently also. I feel like we lost a few teachers'

interest in using the technology, because they were afraid of the computer or the

technologies we used and were implementing. And, the teachers just refused to be

a part of that. So, I would say more intense training and relevance to technology

could have helped the desire and willingness of teachers to implement freely, and

not be forced to just to comply with administration directives.

Kate stated that relevance and level of comfort with technology were factors that

influenced implementation for teachers. She said:

The problem is when you talk about a teacher's comfort and self-identified

strengths, it is very difficult to get them to step outside of that. Strength in their

comfort zone keeps them in that place, especially when they know they are good

at doing it and it has worked for them. If they have to spend the time (and a lot of

that time is outside hours) in order to become strengthened in a place that they are

not comfortable in, it becomes exhausting and thereby hindering the process of

implementation in their classrooms.

Sheila shared factors from her experiences that influenced teacher readiness and

efficacy throughout the early stages of the implementation process. She explained that

not enough time was given to teachers (on the front-end of implementation) to develop

their content and structure the learning environment to be conducive to the digital

learning initiative created by the school district. Sheila said:

We did not have the time and opportunity to build (using the learning

management system, Schoology) our class before students were given their

devices. Teachers needed time themselves to work out some of their own kinks. We were so busy building as we were going that we did not have time to process or truly evaluate if what we were building was the best way to do that. That is why we had so much trouble moving pass substitution on the SAMR model instead of implementing some kind of application (this was the initial goal of the one-to-one process for learners by the superintendent and school board). It took us until year two and three before we began to shift more to application because of the way we began the process. This is year four, and we are still learning how to promote good practices in learning for the students using these devices.

Theme 2: Administrators Views

Administrator participants were at different places on the implementation continuum. There were four administrative participants in the study. Their roles in the process shaped their experiences and how they understood the factors that were pivotal in shaping the stages of the implementation process. Administrators seemed to look at the project from the view of the larger community access to technology and also from alignment with the district strategic plan and goals. They saw the one-to-one initiative as giving more students (and their families) access to technology and also as a way to shift teaching and teacher evaluation practices. Their views were focused on outcomes deemed important by the district. It seemed in general, administrators underestimated the time and training it would take to implement such transformations and the support teachers would need.

Helen was one of the administrators at the school level at the very beginning of the implementation process. She shared her perspective relative to her experience in the following excerpt.

I wish we had given teachers a lot more ideas on how to use the devices with the student and learning management systems, and applications to align with the digital learning initiative approved by the school board as a part of the implementation process. The one-to-one initiative had a purpose of improving student learning using the SAMR model. But it ended up being teachers using it the way they wanted to use it. So, it looked very, very different from one classroom to the next to the next to the next. Certainly we want to give the teacher the autonomy to do that, but I feel like if teachers were not comfortable with the implementation, the implementation in their classrooms were very minimal versus the teacher who embraced it and the impact was very significant for the students in that classroom. In retrospect, we should have provided more instances for growth and provided models for the teachers to work from related to the district digital learning initiative. Some of the teachers just did not have a clue and had never heard of SAMR and did not know anything about LMSs or SMSs or applications. The undertaking was more than giving students portable computers, it was training both students and teachers on best practices with the devices. This was on the major hurdles, creating the same message for everyone and ensuring that everyone understood and had the skills to implement the initiative using the devices.

Bill was a teacher when the implementation started but has since become an administrator. His views were aligned with Kate's from the beginning, but as his role changed and implementation progressed, his views shifted. He expressed that he understood how important the administrator's role was in helping the teachers advance their instructional skills using the devices. Bill stated:

It is now our fourth year into this implementation, teachers are really beginning to learn when you talk about augmentation and the different levels of use, what that looks like with digital learning using the devices, and that is only because we, as administrators, are learning how to measure augmentation and the higher ends of the SAMR model. Now that we understand what to look for, the teachers are getting the feedback needed to alter their instruction to promote the level of learning expected by the district level digital learning policy. We have developed an instrument that measures what level they are at as far as implementing technology in the classroom. The district level administrators wanted us to start evaluating teachers using the new technology instrument. Before we just had the technology goals where they would sign up for technology classes facilitated by the district's tech coaches, but that did not work. The classes were not target or not useful in helping them understand how to use the devices for real instruction and real learning. It was just a checkbox. This instrument tells us if you are at augmentation level or if you are advanced in your teaching methods using technology. We just got to where teachers are learning this. Even myself as an

administrator having to use the instrument really helped me began to visualize

how to get to augmentation or get to those standards, but this is the fourth-year in.

Harold and Martha were on the policy driving end of the implementation. Their

perspective was influenced more from what the district wanted to accomplish with the

implementation of the devices and how that technology could be used to align more with

the district's strategic plan and the district's digital learning initiative. Harold also felt the

mindset of the teachers were a contributing factor to the degree of implementation that

would take place in each individual classroom. He stated:

I will also say the mindset of teachers was a huge factor. Many of them felt the

kids knew more about the technology than they did. So, the perception of the

teachers that were not tech savvy was (I do not want to get into that because I do

not want to look like I do not know what I am doing). So that's one of those

contributing factors that you have to get over, but I think that is also part of if we

want to teach about something, we also have to model it. If I want you to be a

lifelong learner, then I as a teacher have to be a lifelong learner, which means I do

not know everything all of the time. I need help too and that is a mindset shift

for…that is a closed mindset for many teachers. I do not want my kids to know

that I am human. Well, that is part of it.

Harold also mentioned the privilege of living in an area where education is highly

supported by the community was contributing, positively, but also because the school

district was not municipal, posed a unique factor for access to all at home. This made it

difficult to maneuver through the instructional processes for true implementation as he saw it at the district level. He revealed:

> This district supports public education and has an expectation that we are going to support it for all our students. That goes back forty years. When other communities were making decisions that were not that. This one did not. So, the fact that we have the ability to provide these kinds of resources, even though 100% of the teachers are not using it the way that I would hope, we are still providing it for more than other children in other communities have access to. So that is one thing. So, access...I wish everybody had the same access at home. Although we have worked around ways to manage that from the teacher standpoint- download it before you leave- you know this and that. We have tried to do all of that. We still have a device where that continuous 24/7 learning is not possible for many of these kids. That access is one of the factors that shaped the implementation as well. If we were a municipal school district, they would have availability to get it, but we have kids that live in places they cannot get it at all. They do not have access to it. Even if they could pay for it, they do not have access to it, and cannot gain access.

Theme 3: Perceived Student Needs

Participants shared their perceptions concerning how the needs of students, relative to learning and device management, were a factor in the implementation process. Participants stated that students needed guidance/training on how to use the devices, navigate the applications, and in areas of digital citizenship (how to behave in the online

environment, how to be responsible digital citizens). They also needed a place to keep

their devices charged throughout the day to minimize instructional disruptions and

disruptions to their own learning. As simple as these factors may seem, they were a

contributing factor to how well or not well implementation took place in each classroom.

Responses indicated that perhaps more thought needed to have gone into what

infrastructure and what policies and practices were needed to support student

implementation. The fact that these things were discovered after implementation began

slowed the process and caused consternation.

Helen communicated that device management for students was one of her roles,

as school level administrator, after the process began for students. She stated:

There were some, what I call, behind the scenes factors that dramatically

impacted the implementation or how students received and maintained their

devices while at school. Students needed a way to keep their devices charged so

they could stay on task in the classes that were using them. We did not build the

school to accommodate charging laptops in each classroom. I had to decide how

to manage the charging stations for the kids, so, I we bought what I call charging

strips that were plugged in to allow for that, but we still could not accommodate

30 students per classroom. Now we have actual charging stations where they can

plug in (four years later) Another factor that impacted implementation was that

we did not account for...and that was how to make sure students had a device

when there's was being repaired and how do we ensure that cost does by creating

an unfair disadvantage for students whose parents cannot afford to pay for

repairs...you know just things like that from the managerial standpoint was how we approached the one-to-one initiative was kind of our role in implementing that. Some students were without their devices for weeks because the parents could not pay for the repairs. Looking back, I wish I had done a lot of things differently and had things in place to meet the needs of students that were planned and strategic to avoid a disruption in their learning.

Helen had more to say on other areas of need for the students, based on experiences during the implementation. She said:

The students were really just trained on how to carry the device and the safety use of the device, but they needed training in other areas. On the flip side of that, I wish the implementation for the students had focused on how to be a good digital citizen, what you actually supposed to use the computer for, what is appropriate at school to be doing on the computer (this was really needed...and I feel it would have averted some of the discipline referrals and disruptions to learning). More from the aspect of a learning experience for the students instead of a very clinical way of wear your backpack with the strap and carry the computer with both hands…that sort of thing.

Sheila stated:

After four years, we are still having to teach the students how to use the devices more effectively to learn. That was something that should have happened much earlier so that we could be higher on the SAMR model. The need for students to

have that as prior knowledge would have helped us meet the goals of the school district sooner.

Kate disclosed the need for students to have had some targeted training on the word processing application and presentation application on their devices. She stated:

More training on programs that the students would be required to use in classrooms on a regular basis was needed. When they first got them, there was nothing in place to help kids navigate through the new word processor or presentation application. The students were used to using Word and PowerPoint, not Pages and Keynote. Also, the student did not know how to upload assignments or find assignments on Schoology. So, teachers had to take needed time for instruction to do that when it could have been pushed to their devices from tech for them to download and view at their own pace. There definitely should have been a better focus on software training that would be used regularly in the learning environment. It should have happened sooner. The kids can use technology; using tech was never a factor, but how to use it to learn was a factor, and they needed training in those areas. Adequate training should have been implemented before the devices were given to the teachers and the students.

Overall, it was not just the teachers who needed training, but also the students. Participants seemed to agree that addressing student needs up front might have eased the implementation process.

Research Question 3: Views of Stakeholders

The third research question was constructed as follows: *How did the views of stakeholders influence decisions in implementing a one-to-one initiative*? The research question explored diverse perspectives and views concerning decisions in implementing the one-to-one device initiative. Participants shared their experiences concerning the decision-making process. Also, document analysis was used to gather student input from surveys, as students were not a part of the data collection process. Community members were also decision drivers and their views are reflected below. Participants shared their unique experiences related to (1) lack of teacher input, (2) community perceptions, (3) student views, and (4) administrator perceptions. Their experiences are detailed below.

Theme 1: Lack of Teacher Input

Teacher participants expressed their lack of input in the process. They stated that some teachers were asked to be on a committee to decide which learning management system to use and that some teachers were consulted to select the schoolwide device for all teachers, but the participants expressed frustration with the decision process and stated they should have had more input. Kate expressed:

> I really wish we had the opportunity to plan as a department the ways to implement the technology before the students received their devices. That is autonomy that we should have gotten from administrators rather than teacher based, each teacher doing their own thing. The autonomy should have been department based. If we had been consulted, we would have told them how best practices work with our departments. Math is so different from science, science

from social studies, and there are pros to using technology in each area, but some truly lend themselves easier to the technology than others. I feel it should have been better thought out and research should have been used more to guide the implementation process. Maybe as a department, if we would have had the chance to really dissect how we could have made these devices meaningful for student learning, we would have been better prepared when the students received.

Sheila responded:

I came in the year before the switch. A lot of teachers were put on committees and were able to give feedback and Schoology was a part of the one-to-one implementation. The decision process was not related to how we see students learn or what applications we need for our departments, but it was more of a which learning management system to use or color of student backpacks for their devices and covers for their laptops than how we foster learning with the new technology.

Mary and Amy echoed the experiences of each other. Both were a part of the focus group and shared similar expressions and perceptions about the implementation process. Mary mentioned the following during the focus group discussion.

I felt like that came down from the district level. I did not know where I could have voiced my opinion etcetera. It was one of those things I felt like was coming down to the whole from the decision makers at the top, and this is what I am going to have to get on board. I did not feel like I had certain access to say I am for this, or any say on how to implement it. I just felt like it was something I had

to do, regardless. I do not recall many teachers being a part of any of the process

beforehand. Like what do you guys think...What you do you think we should do...

nothing like that happened. We were not given the say we should have been

given. It was just like...here...you need to start doing this in the classroom.

Amy recalled:

I thought it was more of a unilateral approach also where coming from up top:

here is a computer...you need to take it home to play with it, learn how to use it.

This is what we will be doing. So, I would say unilateral approach, definitely.

Overall, the teacher stakeholders did not feel their professional opinions were

sought and that they should have had a stronger role in the decision-making

process. While there were committees with some teacher representation, the

decisions still felt as if they were top down, which may have influenced teacher

buy-in or lack thereof.

Theme 2: Community Perceptions

Participants communicated the district advertised in the local paper two

opportunities for community stakeholders to participate in an open forum about the

digital learning initiative for the district. Harold, an administrator, facilitated the forums.

Harold stated:

Well, I think some of them (community members) responded positively and some

negatively. I have had meetings with parents who communicated – this isn't the

education I want for my child. Well, I respect that, but there are other options, and

this is what we believe is best for most of them. That is what we have to do. We

have to decide what is best for most of our kids and move forward with that. So, I think many parents have embraced it since the initial public meeting.

The high school had more than 1000 students when the digital learning initiative was implemented, but only 344 parents participated in the survey. Survey data revealed that more than 80% of parents felt positively about the educational direction of their children at the high school since their child received their devices. Parents related positively to the comfort level of their child learning how to use the device, educating the students for the future of learning and work using the device, and the ability of their child to continue learning when missing school for sickness and extra-curricular activities.

On the other hand, the survey data also revealed the frustrations experienced by some parents relative to the amount of time that students were spending on devices completing assignments at home. Some parents left comments in the comments box expressing that students needed more details on how to find assignments in Schoology and how to submit them in the different formats requested by teachers. Survey comments also revealed that parents who had negative experiences were more likely to leave details related to their experiences and their child's experiences with the device than the parents who had mostly positive experiences with their children.

Overall, the district provided opportunities for community input through meetings and surveys. The extent to which community views were considered seemed unclear. It seemed most parents were positive about the adoption of the one-to-one initiative, but those who were not seemed to be dismissed.

Theme 3: Perceived Student Views

Participants were asked what they observed, from day to day interactions with their students, relative to student perceptions and views about the implementation process. Participants shared the successes that the students felt and also the frustrations they expressed about the new technology and not being given a choice to use or not to use the technology. Based on what teachers were hearing from students, it seemed they felt neglected, that their input was not sought, and that forcing one way to do things did not leave the flexibility to tailor learning to the individual needs of some students. Bill stated:

> I tracked some of these students in class or talk to them to see how they are coming along with the new device implementation, because everything is on their computers, no books anymore. I have had kids that like particular aspects of it and kids to say, hey, I want a book or hey I want to be able to read or mark up using a textbook. We even had some kids in classes to even request books. I have had to go into the closet and find my old set to send one home with a kid because they said, hey, that is how I learn best.

Amy recalled:

> I have students that want all their stuff on paper. I had two students that came from other districts, that moved after the holiday break from another district and they were having such a hard time. Not just with the class itself but because they could not figure out how to simply open up a pdf or add things to a pdf. It becomes really challenging for them on top of the class being somewhat difficult.

Several of my students would say, a person ought to ask you if you want to pay

$75 for a laptop. Why can we not just use our phones or bring a tablet from home.

They would say everybody does not have the money to pay the technology fee,

and it is not fair. They should have asked us first instead of making us do it. The

students felt they were forced to pay for something that is not needed, and they

did not ask to have. I can tell you the fee was a hot topic and the kids did not like

it. They did not like substituting the computer for paper. They felt like using paper

was faster and when they turned an assignment in, it was turned it.

Sheila revealed:

A lot of them loved the fact that they had computers. They liked to play games on

the computers but did not take advantage of the amount of learning that they

could have experienced. Upper level kids did tend to take advantage of the deeper

learning that the devices helped with, but the lower kids just still wanted a grade

or passing grade. That did not change. We are still having to teach the students

how to use the devices more effectively to learn.

Theresa recalled:

I think the students were responsive, but many of them struggled with the device

and learning how to navigate for assignments and meet the expectations of each

of their teachers in those areas. The majority of us used Schoology, but for the

few that did not comply, it created an inconsistency for the kids that was

challenging. All of us did not follow protocol, and if every teacher followed

protocol, it would have been easier for students to know what to expect across

subjects. But because we did not students would complain about having to submit some work online and some on paper. It was confusing going back and forth for them. Many of our students struggled at the beginning and some still do each year because we do not have a consistent method for instruction and assessment using the devices. I mean a consistent method that students use not teachers.

Students views were also communicated on the student surveys conducted by the school district. According to the student survey data, students felt positively about having and using the device, but did not respond positively about understanding teacher expectations in the classroom related to device usage in learning. Students communicated mixed feelings about their readiness level on certain applications that they were told they had to use to complete work (this was taken from written comments on the student survey). Not enough students commented in writing to get a clear picture of the percentage of students that had negative experiences using certain applications to complete coursework. Overall, student feedback suggested a need to make efforts to get student buy in prior to implementation and also consider alternatives for students whose learning approaches were different. Opportunities for student voice and student training were needed.

Theme 4: Administrator Perceptions

Participants who held administrator positions, at the time of the implementation, communicated a greater degree of decision-making responsibility and played a more direct role in determining the first steps for the implementation process. Harold worked directly with district personnel in determining the type of device that would be used in

the implementation. He was also instrumental in helping secure board   approval to

finance the implementation. Martha was able to have significant input in the type of

professional development that was offered to teachers. She was also responsible for

securing board approval for the number of technology hours each teacher would have to

complete to comply with the school board's digital learning initiative.

According to board documents, the Board of Trustees approved the one-to-one laptop

initiative for the high school during 2014. The Flipping Group was approved to provide

professional development on how to use the devices to flip the classroom for the students.

This was approved to start in 2015 and be completed in 2016. The lease purchase

agreement for the laptop one-to-one initiative was approved in May 2015. Students

received their devices during the 2015-2016 school year. The school board was a key

decision maker with the guidance and planning of Harold and Martha. See Table 6 for a

sample of documents and data analyzed. Harold stated:

> I was one of the leaders for the digital learning initiative. We started talking about
>
> it shortly after I was hired. We visited other schools to look at the different
>
> devices being used for the one-to-one initiative at their locations. I was certainly
>
> one of the most influential leaders for the project.

Martha stated:

> I was in charge of the professional development piece. I made the decisions, along
>
> with a few others, to recommend technology coaches to conduct the in-house
>
> training for the teachers. I admit that what I thought would be the cornerstone of
>
> development, in the area of instruction, was not what the teachers needed four

years down the road. The picture of training has dramatically changed since then. We have technology coaches assigned to schools to support teachers as they learn new ways and techniques to guide the learning of students using technology. The school board did approve a number a training cycle, but no topics occurred as needed and could be scheduled with the technology coaches by the teachers according to their schedules. These trainings were offered online after the initial face to face training during the Summer of 2015.

See Table 7 for the professional development schedule of topics published and approved by the school board.

Table 6

A Sampling of Documents and Data Analyzed

Documents selected	Data analyzed
	One-to-one technology report containing number of devices for high school students
Board meeting minutes, October 2014	Professional development schedule for the next two years for teachers
Board meeting minutes, March 2015	School district learning management renewal
	Lease purchase agreement for the devices
Board meeting minutes, April 2015	Professional development services with Flipped Learning
	Announcement of the parent and community meeting in regard to stakeholder input about the new digital learning initiative in the school district...the dates were May 5th and May 13
Local newspaper, May 2015	Parent responses, concerns, and questions about the digital learning initiative
Board meeting minutes, December 2015	Parent and student surveys

Table 7

Schedule of Professional Development for Teachers

2014-2016 school years Offered virtually as requested by teachers	
Apple Project Based Learning	iPhoto slideshows
Apple Reaching All Learners	Embedding with Schoology
Schoology	Annotations with preview applications
iWorks	PhotoBooth & Green Screens
Flipped learning	Promethean Basics
iMovie trailers	Activinspire browser & tools
Google forms	Pages, Keynote, & Numbers

Additionally, Harold communicated his experience concerning understanding the community in which your school serves as a decision driver that should be considered in determining how the implementation should take place. He stated:

Do not try to do something that is not you. That does not mean you do not push the envelope a little bit but you have got to make it fit with what your community is willing and able to support and that may look like one thing this year and it may change as part of that continuous improvement process, but do not do one thing just because another school did it and do it just like them, because you are not going to have the same issues, challenges and problems that they had. I was reading an article especially dealing with this and one of the scholars that was actually peer reviewing the literature was talking about how school cultures are so different and individual, especially in rural areas and how schools that want to be

> successful have to learn to be the image of their community, but a growing image
>
> educationally of that community

Overall, administrators felt more ownership in the decision process and saw themselves

as leading the change. They also expressed the importance of understanding the needs of

the local community.

Summary

The purpose of this qualitative case study was to explore the perceptions and

experiences of participants relative to how the implementation of a one-to-one device

initiative occurred in a rural high school in Mississippi. In Chapter 4, I presented the

demographics of participants, the data collection process, and the data analysis process

that included the thematic structure that was identified by coding. The themes that

emerged from data collection were directly aligned with the three research questions.

Data aligned with the first research question revealed that teacher participants'

perspectives were directly tied to their roles in the implementation process. Teacher

perspective were very different from that of administrators. Administrators felt that

adequate planning and training were done at the time.

However, teachers expressed the need for targeted training for instructional needs

to be able to implement the technology to support student learning and authentically

enhance instruction. Teachers also expressed a deficit in understanding how classroom

management would and should look as a result of the implementation. Teachers also felt

that not enough emphasis was placed on common management issues with the devices,

such as charging the devices, lack of Wi-Fi access away from school, and the distraction

that Internet access can pose during learning time. On the other hand, participants thought

the push for implementation forced them to think differently about how to engage their

students and thought this was a good result. Additionally, they were also able to

experience, for the most part, a better way to communicate with parents and students

regarding assignments and grading.

Data extracted for research question two revealed that teacher readiness was a

huge component and factor that influenced the implementation process. Teacher and

administrator participants acknowledged the level of comfort that a teacher possessed,

using technology, deeply affected the rate and level of implementation that occurred in

those teachers' classrooms. Also, administrators' understanding of what the school board

wanted was not fully understood right away and hindered the progression of

implementation and impacted how students were to use the devices in the learning

environment. The needs of students proved to be a contributing factor, such as lack of

skill in understanding how to use the learning management system, need for Wi-Fi access

to complete assignments at home to meet teacher deadlines, need to able to keep devices

charged throughout the day, and the need to understand and exemplify digital citizenship

while learning in the online environment.

Data aligned with the third research question illuminated the importance of

teachers being on the front end of the implementation process. Administrative processes

and instructional processes proved to look very different throughout the implementation.

On one end you have policy and planning to align with policy, and on the other end you

have instructional, assessment, and student behavior that is somehow expected to align

with planning, policy, and best practices for instruction and student learning. The data demonstrated that all stakeholders had a significant role and omitting any part of that role created a disconnect that will showed up somewhere during the implementation process and impeded progress.

This school was four years into the implementation at the time of this research and just beginning to look like the proposed expectation from the beginning. Although, administrators looked at other schools for a model to drive the implementation, the unique contributing factors of this school and community proved to be a challenge during the implementation process. The data from research question three showed that it takes more than looking at other models; it takes a mixture of stakeholder input, at each level, to successfully drive implementation decisions. In chapter five, I will discuss some of those areas that may be avenues for further research that may strengthen the implementation process for rural high schools.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

One-to-one device initiatives were designed to place an electronic device, whether tablet or laptop, in the hand of each student the implementation would serve. The purpose of this qualitative study was to examine the process for implementing one-to-one computing devices for students and the methodologies, if any, used to implement these technologies in a public rural high school in Mississippi, with a focus on policy development and stakeholder views. Although no students were directly interviewed, student data was collected from the school district's surveys and participants communicated perceived student views related to the implementation process.

The nature of this qualitative case study was to better understand the perceptions of the participants, gain insight into the unique experiences of the participants, and to explore their in-depth understanding of the implementation process as it related to their personal experiences and observation of the experiences of others. By understanding the favorable and unfavorable experiences of the participants, other rural schools can make better decisions from the beginning to mitigate the pitfalls revealed in this study, as well as imitate and celebrate the successes revealed in this study.

The analysis of the one-to-one device initiative in a rural high school in Mississippi was relevant to the research questions regarding the experiences of the participants and their perceptions of the implementation process before, during, and postimplementation. The first research question explored teachers' and administrators' perceptions and school board policy related to the actual process of implementation of the

one-to-device initiative. Key findings indicated that there was a plan for the implementation process on the administrative level, but the expectation and framing of the plan and the end product of transforming instruction and learning were not defined or clearly understood by vital stakeholders who would be implementing the initiative.

The second research question explored the participants' perceptions concerning the components that influenced the progression and or digression of the implementation process. Key findings indicated that there was a need for more teacher training and student support from the onset of implementation. The third research question explored diverse perspectives and views concerning decisions in implementing the one-to-one device initiative. The key findings indicated that administrative participants felt more ownership in the implementation process and saw themselves as leading the change.

The major sections of this chapter include an interpretation of the findings and limitations of this study. Additionally, I include the recommendations for further study, implications for positive social change, and a conclusion.

Interpretation of Findings

In this section, I communicate how the findings of the study connect to the literature review in Chapter 2. Subsequently, I show how the findings of the study connect to the conceptual framework of implementation science through the theoretical lens of NPT and adaptive implementation. I also communicate what successful implementation looks like through the lens of the participants of the study and how impediments may be avoided for rural schools using data from this research study.

Connections to the Literature

Teacher participants' perceptions in the area of lack of training related to the one-to-one device implementation aligned with the perceptions of teachers revealed in the literature review in Chapter 2. In the literature review, teachers revealed that lack of training proved to be a barrier to implementation and left them unprepared for the one-to-one learning environment (Rowsell et al., 2017). The data revealed that teachers felt they were not prepared for the implementation process due to the deficiency in training received during the preparatory stages of implementation. In this respect, data and literature do not differentiate teacher preparedness. Teachers across rural, suburban, and urban areas experienced like results in implementing a one-to-one program where lack of preparedness was a contributing factor to issues with implementation (Rowsell et al., 2017).

Teachers' perceptions also revealed that the lack of training extended to classroom management while using the devices in the classroom setting (Dundar & Akcayir, 2014; Reid, 2014). In other words, the lack of preparedness had a profound effect on how the teachers facilitated or controlled learning in the instructional environment. Additionally, this lack of preparedness became the driving force behind disruptions and the inability to guide the behavior of the students in a technology infused instructional setting, similar to findings by Reid (2014). However, administrator perceptions did not align with that of the teachers, a finding also supported in the literature. Storz and Hoffman (2013) found that while some teachers felt overwhelmed

with disciplinary challenges due to the implementation of the new technology, administrators felt that adequate training was provided prior to implementing the devices.

Data revealed the administrators were higher-level decision makers who owned the implementation process from its inception, whereas teacher participants felt they were not asked to participate as necessary on the planning end. As a result of the disconnect, teachers lacked an understanding of the expectations of administrators and administrators did not understand the needs of teachers and students related to the implementation. Tallvid (2016) had similar findings about the disconnect between teacher and administrator perceptions that were due to the role each may or may not have played during the implementation process. Teacher participants reported that some students demonstrated a lack of preparedness using the devices in the learning environment, a finding aligned with Warshauer et al. (2014). Teacher perceptions from the data collected revealed that some students struggled with the software applications (installed or online) used to deliver course content and assess learning.

Teachers also reported a lack of student efficacy related to not understanding how to use the devices in the classroom. Subsequently, student survey data obtained from school board minutes aligned with the lack of efficacy reported by teacher participants interviewed. Reported student and teacher efficacy issues stemmed from the lack of training experienced before and during the early stages of implementation. Tallvid (2016) also indicated that teachers felt that students should have been given adequate time to orient to the device as well as the software applications required for instruction, learning,

and assessment. Administrators did not address training opportunities for students during data collection.

Additionally, data revealed the economic impact that the one-to-one device implementation had on some students and parents. Teacher participants reported that some students could not afford the fee and fell behind on assignments because of not having the device to complete assignments. Data also revealed the frustrations of parents in relationship to the cost of the device itself when students had to pay for damage and or replacements. According to Gonzales (2019), technology fees were to pay for repair and replacement, but the reasoning behind the fee did not lessen the financial strain on parents and student caretakers. When compared to the literature (Gonzales, 2019), the data did not reveal that the economic impact that was imposed on parents was any different in rural schools than nonrural schools.

Connections to the Conceptual Framework

Implementation science (NIH, 2014), used as the conceptual framework for this study, provided a lens to explore, investigate, and report major concerns that impeded effective implementation. The framework of implementation science was designed to create knowledge from evidence-based practices that may be transferable across settings, disciplines, and contexts (Procter et al., 2011). However, the concept of implementation science is not a standalone concept. The conceptual framework of implementation science needs a lens by which to understand how the implementation process worked (Nilsen, 2015). For this study, I used two theoretical lenses: NPT (McEvoy et al., 2014) and adaptive implementation (Byrk, 2016).

The findings of this study communicated some complexities or situational contexts that could not be controlled or changed once implementation began that impacted optimal implementation. NPT (McEvoy et al., 2014) and adaptive implementation (Byrk, 2016) were considered throughout the data collection and data analysis process. However, due to reported implementation integrity issues from the data, such as lack of training, lack of teacher and student input, affordability of devices by parents, and lack of clearly understood expectations of district level administrators, NPT did not prove to be an efficient lens by which to understand the results of this study. On the other hand, adaptive implementation provided a better lens to understand how this implementation could have been optimal for this rural school.

During the implementation process, there were contexts that could not be controlled for such as lack of prior training needed (students and teachers) to create optimal conditions for implementation and the condition of socioeconomic status (Wood, 2017) for the student population. Because the training for students and teachers was missing from the beginning, there was no way to account for that missing component to drive optimal implementation; therefore, the implementation started with a process that would impede conditions for ideal implementation. Additionally, due to those impediments, normalizing an optimal process under less optimal conditions would be difficult; therefore, adaptive implementation may be the better lens from which to guide the implementation process (Byrk, 2016). Adaptive implementation provides flexibility in the implementation process and does not follow a strict or standardized/normalized process.

According to Byrk (2016), there is nothing wrong with realizing that some components of a process have not worked. When that deficit is recognized, the stakeholders may want to find out why it has not worked and address the process issues or provide more supports to sustain the process. A clearer process may emerge through adaptive implementation that could possibly be used in other like contexts to inform implementation. Seeking to understand this study through the lens of adaptive implementation may help rural school districts in the future better plan for one-to-one device implementations. Adaptive implementation (Byrk, 2016) provides a lens for understanding and accounting for situational contexts that you cannot always control (socioeconomic status, readiness level of students and teachers, and stakeholder input) from the beginning and may help rural high schools create a better implementation restructure for optimal implementation.

Limitations of the Study

One of the limitations of this study was the sample size which is indicative of qualitative single case studies. I used a purposive sample from the beginning, strictly relying on the willingness of the participants to participate in the study, however, I informed potential participants that they must have been working at the high school when the implementation process began to participate in the study. I interviewed five of approximately 80 teachers at the high school and four district administrators. The small sample size from most qualitative studies do not lend to transferability of results (Maxwell, 2013; Yin, 2009). I originally sought 7-12 participants for the focus group and only had 3 to consent. Additionally, I wanted 10-12 participants for the individual

interviews, but only 7 consented to participate. Participants were high school teachers from varied teaching disciplines and varied level administrators, and the teachers and administrators that volunteered may have had different views from those who did not volunteer. Participants may not be representative of other teachers and administrators in other areas of the state of Mississippi or the United States. Additionally, the unique factors that impact the experiences of schools in rural areas may not transfer to schools in nonrural areas or other rural schools with different demographics, social, and or economic statuses.

Other limitations resulted from the implementation of the study. I relied on the accuracy of memory and honesty of the participants. The data collected depended on the willingness of participants to be honest and accurate in communicating their perceptions and experiences. Additionally, the survey data reviewed in the study did not clearly delineate the perceptions of students and parents across defined areas of frustrations or challenges. That made it difficult to draw clear conclusions about the areas in which they felt most challenged; thereby, limiting the richness of the findings from the survey data.

Also, as a former teacher in the school, I had knowledge of the implementation process. I kept a reflexive journal to record my thoughts while analyzing the interview data. I wanted to be clear not to allow my own experiences to impact or influence the shaping of categories and themes from the data. Additionally, during the time that the teacher surveys were taken, I was a teacher at the high school. However, the survey data did not collect email addresses or names and did not disclose any personal information about any responses written or tabulated. Therefore, I had no knowledge of how my

responses were represented, or not represented, in the data collected from the teacher surveys.

Another limitation was related to the document data such as board minutes, surveys, and newspapers. These reports may not be complete and may not be a true representation of the population. Additionally, the researcher did not have control over the sample size, who was sampled, what constructs were measured, and how they were measured for the surveys. Therefore, data collected from board meeting minutes, already conducted surveys, and archived newspapers may not be reliable to inform practice

Recommendations

Through this study it became evident that further study is needed to understand the dynamics of stakeholder views and how those views are influenced in rural societies relative to the one-to-one implementation initiative and policy development that directly impacts the flow of the implementation process. Additionally, further study is needed to understand how NPT, and its underpinnings, may be used to produce a more effective implementation route to successful implementation in rural high schools (Wood, 2017). Furthermore, additional research may be needed to understand how classroom management evolves throughout the process of implementing a one-to-one device initiative to aid in transitioning to a productive classroom management style for one-to-one schools and classrooms in rural societies.

Implications

The one-to-one device initiative was implemented in schools across the nation as early as 2001 (Nilsen, 2015), but had not been researched from the perspectives and

experiences of the rural school setting. The data and results from this study add to the body of knowledge relative to the perception of teachers and administrators in a rural high school in Mississippi. Based on this study, the results show that teachers would have felt more prepared for the implementation of the one-to-one devices, if more specialized training was provided to them before the implementation actually started, and if they had been given the opportunity to have a greater role in the policy development process for the implementation.

Administrators, at the district level, felt that adequate training was provided to help teachers start the process and understood that more training would be provided after the process began based on the administrators' two-year training schedule. On the other hand, building level administrator (principal) participants experienced the same frustration as teachers and expressed the need for more specialized training from the onset of the implementation for teachers, similar to recommendations by Simmons and Martin (2019). Simmons and Martin (2019) also found that teacher participants' perceptions of student deficits with technology use were directly related to lack of training on the software applications that the students were expected to use.

One implication for social change related to policy development, based on the results of this study, is that policy development should include input from teachers, building level administrators, parents, and students. This should be done to better understand their unique perspectives, challenges, and strengths in the area of policy development and technology as it relates to instruction, learning, and digital citizenship within the school setting and away from the school setting (students transport and use the

devices in multiple settings in a one-to-one platform). An additional recommendation for social change would be to include more upfront training for teachers and students on the software and hardware that will be used during the implementation process. The more prepared teachers and students are to use the devices and manipulate the software and/or online based technologies, may increase the probability of effective and successful one-to-one implementation across contexts (Simmons & Martin, 2019).

Implementation processes are more likely to be successful when key stakeholders are a part of the policy development process (Zyad, 2016). Additionally, the authors also found that teacher participants were willing to engage in training opportunities to support the use of digital learning devices and platforms in instruction and assessment (Zyad, 2016). Perhaps, policies could be developed to allow for more direct and guided training to support teachers in the area related to the class or classes they teach. Additionally, the results of this study also revealed that teacher perceptions, regarding student efficacy, revealed a lack of preparedness that students related to the use of the device in the learning environment. Policies could be developed to support student acclimation to the digital learning environment, possibly adding an additional layer of positive self-efficacy in the digital learning environment for students. According to Byrk (2016) there is nothing wrong with realizing that some components of a process have not worked. When that deficit is recognized, the stakeholders may want to find out why it has not worked and address the process issues or provide more supports to sustain the process. A clearer process may emerge through adaptive implementation that could possibly be used by other like contexts to inform implementation

An implication for practice related to social change, based on the results of this study, is to prepare teachers for classroom management in the digital learning environment. Teacher participants and administrators disclosed the challenges they faced during the one-to-one implementation in the area of classroom management. The participants expressed the challenges experienced and/or observed related to classroom management due to their lack of understanding how students behave in a technology infused environment. According to Blau et al (2016), many teachers struggle with classroom management in a one-to-one based classroom. This suggested that changing teachers' practice to accommodate a one-to-one classroom necessitates a role change on the part of the teacher (Blau et al., 2016). Subsequently, this practice may be derived from observing other practitioners in the classroom and/or by the school providing training to teachers in the area of classroom management in the one-to-one environment as recommended by Peled, et al (2015). Another implication for practice would be to communicate with parents and the community concerning the expectations relative to the implementation process. Parents and community members need to know the role they will play in supporting the implementation process. Additionally, the data and research suggest that the needs of teachers and students were not always understood by the administrators. Therefore, a recommendation would be to provide administrators with tools that would better help them understand the instructional needs of teachers and learning and social needs of students prior to the decision- making process (Simmons & Martin, 2019).

Conclusion

The implementation of one-to-one device initiatives has been a well-studied topic. However, the perceptions and experiences of rural high schools, relative to the one-to-one device implementation, have largely been masked in research. Studies show that students tend to be more engaged while learning with certain technologies; however, studies also show that keeping students engaged in a technology infused environment has been a challenge for many educators (Peled, et al., 2015). Additionally, the process of implementation, according to the results of this study, did not holistically consider the unique needs of teacher, administrator, parent, and student stakeholders. The lack of such consideration may have contributed to the many challenges that this rural high school encountered during the implementation process.

In this qualitative single case study, I explored the perceptions and experiences of five teachers and four administrators related to the implementation of a one-to-one device initiative in a rural high school in Mississippi. Participants reported the positive impacts and challenging factors that progressed and/or hampered the infusion of this initiative in the rural school. With training and professional development and a more inclusive atmosphere for developing policies regarding the one-to-one device implementation, teachers and administrators may be better prepared to demonstrate their proficiency and experience in teaching and assessing in a digitally infused one-to-one device school.

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Appendix A: Interview Questions

A Case study of a One-to-one Device Initiative in a Rural High School in Mississippi

Interview Questions for Individual Teachers

RQ1: Implementation Process

1. Can you provide some examples of how you used technology for instruction or in other ways related to your teaching practice prior to the one-to-one initiative?

2. Can you describe training provided to you before and/or after the implementation process began?

3. How did your use of technology change after the one-to-one initiative began?

4. What challenges and what successes did you experience in trying to implement the one-to-one program?

5. How are your teaching practices different today than before the one-to-one initiative?

6. In retrospect, what would you have liked to have seen done differently or what would you change about the implementation process?

RQ2: Factors Influencing Decision

7. Who were the primary proponents of implementing a one-to-one program?

8. What were the reasons articulated to teachers for implementing the program?

9. What things did you think about in terms of pros and cons for implementing a one-to-one initiative before, during and after implementation?

RQ3: Views of Stakeholders

10. How were teachers asked for input and/or direction before the process began?

11. How has your perception of technology in schools evolved since the implementation process?

12. What are your perceptions of student responsiveness to the one-to-one initiative?

Interview Questions for Superintendent and High School Principals

RQ1: Implementation Process

1. What were your perceptions of technology use in the school prior to implementation of the one-to-one initiative? What are your perceptions now?

2. Describe your role in implementing the one-to-one initiative?

3. What training was provided for your staff and teachers before and during implementation of the initiative? What were the goals of the training and were the goals met?

4. What barriers to implementation were identified and how did you address those barriers?

5. In retrospect, what would you have liked to have seen done differently or what would you change about the implementation process?

6. What advice would you give to other rural schools that are considering this process?

RQ2: Factors Influencing Decision

7. Who were the primary proponents of implementing a one-to-one laptop program?

8. What reasons did you articulate to your teachers and staff for implementing the initiative?

9. What pros and cons did you think about in terms of implementing the one-to-one initiative?

RQ3: Views of Stakeholders

10. What were your perceptions of one-to-one initiatives before implementation took place? What are your perceptions now?

11. How do you feel your staff and teachers responded to the implementation process?

12. How do you think students and families have responded to the one-to-one initiative?

Interview Questions for the Board of Trustees

RQ1: Implementation Process

1. What were your perceptions of technology use in the school prior to implementation of the one-to-one initiative? What are your perceptions now?

2. Describe the Board's role in implementing the one-to-one initiative?

3. How did you determine the cost of the implementation? How did you pay for the implementation?

4. Were there issues during the implementation process that required Board decisions or intervention?

5. What advice would you give to other rural schools boards that are considering this process?

RQ2: Factors Influencing Decision

6. What type of groundwork was done prior to the Board considering the approval of a one-to-one initiative (was any research done, what kind, and when)?

7. What stakeholder views were expressed to you and the Board as you were considering approving this initiative?

8. What were the key reasons the Board was considering this initiative and what were the deciding factors?

9. What convinced you to support (or not support) this initiative?

RQ3: Views of Stakeholders

10. What are your views of the benefits and detriments of implementing a one-to-one initiative in a rural school district?

11. How have your views of one-to-one initiatives evolved over time?

12. How do you think students, parents, and community members have responded to this initiative?

Interview Questions for Parents

RQ1: Implementation Process

1. How did you view the high school in terms of technology use prior to the initiative? How do you view it after implementation?

2. What was your role as a parent or as a member of the PTA during implementation of the one-to-one initiative?

3. Tell me about any pitfalls or challenges you, the PTA or the school experienced related to the implementation?

4. Tell me about any successes or accomplishments you, the PTA or the school experienced related to the implementation?

5. What would you tell other parents or PTA members about going through the implementation of a one-to-one initiative?

RQ2: Factors Influencing Decision

6. How were you and/or the PTA consulted by the decision makers prior to the decision to implement a one-to-one initiative? After the decision?

7. What reasons were you given for the decision to implement the one-to-one initiative?

8. What do you think are the most important reasons to adopt or not adopt a one-to-one initiative?

9. What are some advantages to the community relative to this implementation?

RQ3: Views of Stakeholders

10. What are your views of the benefits and detriments of implementing a one-to-one initiative in a rural school district?

11. How have your views of one-to-one initiatives evolved over time?

12. How do you think students, parents, and community members have responded to this initiative?

Interview Questions for Technology Director

RQ1: Implementation Process

1. When and how did you first become aware that the school would be implementing a one-to-one program?

2. What was your role in either making the decision to move forward or in implementation after the decision was made?

3. How did implementation of this program change your job?

4. What challenges and successes did you experience or observe during the implementation?

5. In thinking back, are there things you would have done differently?

6. What advice would you give to other technology directors in rural schools in regards to implementing a one-to-one initiative?

RQ2: Factors Influencing Decision

7. What reasons were articulated to you for initiating a one-to-one initiative?

8. What reasons do you think were the critical reasons for making the decision to move forward?

9. What things influenced your decisions about how to support the implementation?

RQ3: Views of Stakeholders

10. What are your views of the benefits and detriments of implementing a one-to-one initiative in a rural school district?

11. How have your views of one-to-one initiatives evolved over time?

12. How do you think students, parents, and community members have responded to this initiative?

Appendix B: Individual Interview Guide

Introduction

Good evening, my name is XXXXX and thank you for coming. We will be participating in a focus group discussion today.

Purpose

We are here today to discuss the implementation of the one-to-one device initiative that took place at your school. The aim is to get your perceptions of the process from its inception and how that process unfolded along the way. I would like for you to feel comfortable speaking how you really think and how you really feel.

Procedure

I will give you a copy of the consent form. We will go over it and I will ask you to sign it and give you a copy of the signed form before we conclude the interview. I will be audio recording this session and taking handwritten notes as we dialog with each other. There will be no presence of a video recorder in this session. The purpose of the audio recording is to ensure that I capture your authentic words as you speak them and the tone in which you speak them. I want this to be a collaborative discussion; therefore, feel free to respond at any time to me. This session should last approximately forty-five minutes to an hour. There is a lot to discuss, and I may move the discussion along at times.

Participant Introduction

Now let us start by you sharing your first name, what you teach, and how long you have been teaching.

Interview Questions

[Insert appropriate set of interview questions from Appendix C]

Closure

Thank you again for your participation. Is there any other information regarding your experience in this process, that you think would be useful for me to know? Your time has been very much appreciated and your comments have been very helpful. If you think of anything else you would like to share, please feel free to contact me. Once the study is completed, a copy will be provided to your school for you to review. Again, thank you for your time.

Appendix C: Focus Group Guide

Introduction

Good evening, my name is XXXXX and thank you for coming. We will be participating in a focus group discussion today.

Purpose

We are here today to discuss the implementation of the one-to-one device initiative that took place at your school. The aim is to get your perceptions of the process from its inception and how that process unfolded along the way.

Ground Rules

I would like for you each of you to feel comfortable sharing how you really think and how you really feel about the one-to-one laptop implementation process. As part of that, you each need to agree to keep what is said in this focus group confidential and not disclose information from this discussion after you leave here today. In addition, to ensure we hear from everyone, please be mindful of the amount of time you spend speaking. Please ensure others have a chance to express their views. Also, all perspectives are values and we must each be respectful of everyone's opinion. If you feel uncomfortable at any time, you may leave the focus group.

Procedure

I will give each of you a copy of the consent form. We will go over it and I will ask you to sign it and I will give you a copy of the signed form before you leave. I will be audio recording this session and taking handwritten notes as we dialog with each other. There will be no presence of a video recorder in this session. The purpose of the audio

recording is to ensure that I capture your authentic words as you speak them and the tone in which you speak them. I want this to be a group discussion; therefore, feel free to respond at any time to me or any of the other participants in the room without waiting to be called. However, I would appreciate if only one of us talked at a time and that everyone is given an opportunity to share. This session should last approximately 45 minutes to one hour. There is a lot to discuss, and I may move the discussion along at times.

Participant Introduction

Now let us start by each of you sharing your first name, what you teach, and how long you have been teaching here.

Interview Questions

RQ1: Implementation Process

1. How did the one-to-one device initiative start in your school? Was there any preplanning and how did that take place?

2. Did you have any input as to the type of device and software to be purchased for student/teacher use or in the amount of time it would take for full implementation?

3. How comfortable were you with the devices chosen and using them to teach? Probe: What contributed to your comfort or lack of comfort?

4. What type of training did you receive prior to implementation and beyond?

5. What were some things that you felt were barriers along the process? Probe: Why did you view them as barriers?

6. What were some things that you felt were successes along the process? Probe: Why did you view them as successes?

7. What were some things you feel should have been considered in retrospect? Probe: Why do you feel they should have been considered?

RQ2: Factors Influencing Decision

8. What were the reasons you think the school chose to implement this program?

9. What things influenced your own thinking about one-to-one initiatives in schools?

10. Were there some things that you think were more influential than others in deciding to implement a one-to-one initiative?

RQ3: Views of Stakeholders

11. What were your initial feelings when you first realized that all students would have a device each day they entered your classroom and how did those feelings guide your practice? Probe: Why did you have these feelings?

12. How have your perspectives about one-to-one devices in schools evolved over time?

Closure

Thank you again for your participation. Is there any other information regarding your experience in this process, that you think would be useful for me to know? Your time has been very much appreciated and your comments have been very helpful. Please be sure not to share our conversation after we leave here.

If you do think of additional things you would like to share, please feel free to contact me individually. Once the study is completed, I will provide a copy to the school. Again, thank you for your time.

Appendix D: Document Analysis Form

The following questions guided the document analysis process for the historical

documents used in the study.

1. Who was the author?

2. When was the document produced?

3. Where was the document produced?

4. What was purpose of the production of this document?

5. What was the document type?

6. Who was the intended audience of the document?

7. What was the document content/findings?