

INTEGRATING GOOGLE APPS AND GOOGLE CHROMEBOOKS INTO THE CORE
CURRICULUM: A PHENOMENOLOGICAL STUDY OF THE LIVED EXPERIENCE OF
PUBLIC SCHOOL TEACHERS

by

Paula Bartolo

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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2017

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ABSTRACT

The purpose of this phenomenological study was to understand the lived experiences of public school teachers using Google Suite for Education with Google Chromebooks integrated into the core curriculum. With the adoption of Common Core standards by 46 states, the increased use of technology has occurred due to standards that integrate technology. Google has created a free cloud-based educational suite for K-12 and Higher education institutions. The central research question that guided the study was: How do grade 4-8 public school core content teachers perceive the experience of using Google Suite for Education with Chromebooks in the classroom? The theory that guided the study was Albert Bandura's social cognitive theory (1986). The theory places an emphasis on three main factors influencing how one learns from personal, social, and environmental. Self-efficacy as part of the learning theory plays an important role in discovering teacher willingness to integrate technology in the classroom. The participants were 13 grade 4-8 public school core content teachers. Data collection included individual interviews, focus group interviews, and online journals. A questionnaire was used to purposefully select participants. Semi structured interviews and focus group interviews were recorded and transcribed as well as online journals analyzed through significant statements resulting in the following four major themes: teacher attitudes and instruction, Chromebook accessibility and connectivity, student learning, and inconsistent training and support. The results identified the essence of the shared experience of the study participants.

Keywords: Chromebooks, Google Apps, Teacher Perception, Technology Integration

Copyright Page

Dedication

I dedicate this dissertation to my family. My mother and sister prayed for me constantly during this process and my nieces were able to witness the Lord's hand in this journey. Jesus was my anchor in the midst of the many storms that encompassed the years of this doctoral journey that my family and I went through. I finally made it through the desert and crossed the Jordan! Only through Jesus was this possible may all Glory go to Him!

Acknowledgments

I would like to thank my dissertation chair Dr. Randy Tierce for all his feedback, guidance, encouragement, and support you are a blessing to me. I also want to thank Dr. Rev. Damgaard for the many years that you were part of the committee and all your encouraging words and prayers. In addition, to Dr. Richards, thank you for your encouragement over the years and your note once to me “it’s a cinch by the inch” and all your wonderful feedback, time, and support during this journey. I would also like to acknowledge the site for granting me the permission to conduct this study. In addition, a special thank you to the participants in this study; I cannot thank you enough for all of the time you dedicated. May God bless you all!

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List of Abbreviations

Common Core State Standards (CCSS)

English Language Arts (ELA)

Google Apps for Education (GAFE)

G Suite for Education (GSFE)

International Society for Technology in Education (ISTE)

One-to-one (1:1)

Partnership for Assessment of Readiness for College and Careers (PARCC)

CHAPTER ONE: INTRODUCTION

Overview

Schools throughout the United States utilize curriculum frameworks to guide the instruction of curriculum for each subject and grade (Common Core State Standards Initiative, 2016). Multiple states have adopted the Common Core State Standards (CCSS) into their curriculum for Math and English Language Arts (Common Core State Standards Initiative, 2016). CCSS integrate the use of technology in the classroom. For example, English Language Arts (ELA) literacy skills include a standard that calls for student use of multimedia when presenting (Common Core State Standards Initiative, 2016). In addition, a Common Core literacy standard includes student collaboration with classmates and teachers (Common Core State Standards Initiative, 2016). States that have adopted the Common Core Standards into their state curriculum frameworks are now challenged with the need for teacher instruction that integrates technology into the core curriculum to meet state curriculum frameworks that have adopted CCSS.

United States K-12 teachers are facing changes in instruction due to local and state standards that implement the integration of technology as found in the CCSS frameworks. Varying school systems across the United States are integrating various technology devices such as Chromebooks and the implementation of Google education services as part of the school day. Technology implementation in the classroom has been added as an additional skill set that teachers are required to embrace. This chapter includes a brief background on Common Core State Standards and their impact on teaching pedagogy, as well as my position within the study as the researcher experiencing the implementation of technology in the classroom. Additionally, the problem and purpose are explained, the central research question and secondary questions

that guided the study are presented, and pertinent definitions described. The chapter concludes with a concise chapter summary.

Background

The integration of technology by teachers has been a topic of study since 1986 (Christensen, 2002; Cuban, 1986; Jonassen, 2000). Additionally, consumer use of smartphones and mobile technology such as tablets has increased. For example, children as young as two years old are being introduced to iPads and smartphone technology by their parents (Radesky, Schumacher, & Zuckerman, 2015). Technology has increased in everyday lives and the use of mobile technology has carried over to the educational environment for its perceived potential for increasing student motivation and achievement (Williams & Larwin, 2016). Scholars have studied teacher attitudes towards technology; however, research has evolved to focusing specifically on the integration of technology using specific applications or tools (Cuban, 1986; Li, 2007). Part of the evolution of educational technology can be attributed to specific state mandates and curriculum development that require teachers to develop learning situations incorporating student technology literacy skills as found in the CCSS (Common Core State Standards Initiative, 2016). Thus, there is a need for teachers to integrate technology to meet specific educational frameworks such as state standards and Common Core State Standards (CCSS) adopted by the majority of states (Common Core State Standards Initiative, 2016). Pearson's Partnership for Assessment of Readiness for College and Careers (PARCC) has created testing to measure student college and career readiness and has replaced specific state testing with PARCC testing. Currently, two frameworks for measuring teacher and student technology pedagogy and student technology skills include the "Partnership Framework for 21st Century Learning" and teacher and student "National Technology Standards (NETS)" by the

International Society for Technology in Education (ISTE). Furthermore, understanding the use of G Suite for Education in the context of the K-12 education is of main interest due to the increased use of schools integrating GSFE and Chromebooks into the classroom (Sahin, Top, & Delen, 2016; Schaffhauser, 2014). In fact, the amount of spending on technology infrastructure and the adoption of devices continues to be implemented by various schools partially due to online state testing (Schaffhauser, 2014). According to Schaffhauser (2014), District of Columbia schools received four million dollars to prepare their technology for state assessments. In addition, the Burlington Public Schools (located in the state of Massachusetts) technology department emphasized that proper infrastructure was of most importance prior to device selection (Schaffhauser, 2014). Furthermore, public schools across the United States are spending and implementing cloud-based devices to meet the demands on online assessments such as the PARCC assessment (Schaffhauser, 2014). The main constituents affected by the integration of G Suite for education with Chromebooks includes local taxpayers, school boards, school administration, pre-service teachers, and in-service teachers.

Current scholarly research on Google apps in the K-12 setting with Chromebook devices is almost non-existent. Furthermore, the few existing studies on Google Apps in the K-12 environment are mixed method studies that have few participants, are subject specific, include student perception and not the teacher's perception, or are studies on the use of Google applications only in the higher education environment that employ a mixed-methods approach (Brown & Hocutt, 2015; Sahin et al., 2016). These mixed method studies that include qualitative data have very low number of participants and do not focus on the phenomenon experienced by the participants. Current phenomenological research does not exist in studying the shared lived experiences using both G Suite for Education with Chromebooks.

School systems will benefit from the proposed research in order to prepare various constituents affected by the adoption of the cloud-based computing solution with devices. Higher education facilities with school of education departments will benefit from the research in order to prepare pre-service teachers with the skill set needed in order to use best practices with integrating lessons and teaching using G Suite for Education, Web 2.0 resources, cloud-based services, Chromebooks, and mobile devices. Furthermore, it was anticipated that the research would add to the breadth of research and fill the gap in the area of teacher perceptions and shared lived experiences using the G Suite for Education with Chromebooks. Lastly, the research offered insights into preparing best practices and approaches to equipping school staff, technology departments, administrators, and teachers to be successful in adopting Google's educational solution suite and Chromebook computing device.

Situation to Self

My motivation for conducting this study was due to my personal and professional interests in educational technology. My background in technology education includes working with students and adult learners in integrating technology into the curriculum. Being an instructional technology teacher has allowed me to view and experience the various facets and challenges in integrating technology in the classroom. Having recently experienced the implementation of Google Suite for Education and the increased use of Chromebook devices in my work environment has caused me to be specifically interested in core content teacher voices in implementing these new tools. The implementation of this new technology has changed the way students are learning in their classrooms and the way teachers are presenting their materials. In addition, I am also integrating G Suite for Education with Chromebooks with my own students to equip them with the knowledge on how to use these new resources. Having

experienced students' excitement to work with Chromebooks and observing teacher pedagogical shifts while mentoring teachers in working with GSFE has sparked an interest in me to learn more about this growing technology and adoption of it by fellow teachers. Due to the newness of cloud computing with Chromebooks, there is a lack of research in this area. I had the desire to discover the phenomenon that teachers experienced in working with GSFE and Chromebooks to further understand their beliefs, experiences, challenges, goals, and best practices.

This study has an inherent axiological philosophical assumption. Creswell notes that a researcher acknowledging an axiological assumption "openly discusses values that shape the narrative and includes his or her own interpretation in conjunction with the interpretations of participants" (2013, p. 21). In order to place aside bias in interpretation I journaled any pre-suppositions throughout the research through bracketing my experiences prior to interviews and before data analysis. In addition, a social constructivism paradigm guided my research in order to understand and interpret the climate, background, and shared experiences of teachers using GSFE and Chromebooks within their teaching. It is important to note I only agree with social constructivism in the realm of collaborative learning in which learning can be gained from others modeling and sharing their experiences on how to complete a task. I do not agree with the constructivist point of view in that there is no absolute truth, for I believe in an absolute truth and that is found through only God the Father, creator of the heavens and the earth.

Problem Statement

Technology integration continues to be a challenge for schools due to the difficulty in introducing various technology resources to teachers and their willingness to adopt and integrate new technology into their daily lessons. Although schools are upgrading their infrastructure to handle new technologies and 1:1 programs, teacher adoption continues to be a struggle due to

varying barriers such as administrative support and training (Ertmer et al., 2012). Using G Suite for Education is considered a resource for integrating Common Core State Standards (Robertson, 2013). Sahin et al. (2016) note that teacher attitudes towards Google Chromebooks changed from positive to negative over a school year due to technical issues such as disabled devices and blocked websites. Also, it is very important to understand the teacher's voice to further understand the shared phenomenon providing research on Google's growing cloud-based solution and Chromebook trend in education. There is a deficit in research on Google Suite for Education with Chromebook technology. Furthermore, there is a lack of research giving a voice to teachers that have been exposed to G Suite for Education and Chromebook devices within the classroom. Therefore, the problem of the study is the lack of understanding regarding the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the core curriculum.

Purpose Statement

The purpose of this transcendental phenomenological study was to understand the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the curriculum. Lived experiences were generally defined as shared experiences, teaching practices, and beliefs using G Suite for Education with Google Chromebooks to integrate technology into the curriculum. The theory that guided this study was Bandura's (1986) social cognitive theory and self-efficacy as it provided as a framework in understanding teacher's attitude, perceptions of technology, and the understanding of their willingness to use technology in the classroom.

Significance of the Study

This study is significant because it will contribute to the existing body of research on GSFE with Chromebooks. In addition, this research extends beyond the current research (Brown & Hocutt, 2015; Sahin et al., 2016) on GSFE for it explored the need for understanding of the core content teachers' perceptions of using GSFE and Chromebooks in the teaching practice. These experiences included understanding the voice and emerging themes of teacher perceptions of working with this latest technology. Through an understanding of shared experiences by teachers the phenomenological approach allowed for the experiences to be furthered explored. Creswell (2013) notes that, "the phenomenological approach is useful for understanding the shared experiences of a group and their experience with the phenomenon" (p. 81). It is also important for K-12 teachers, administrators, technicians, and technology departments, higher education institution school of education preparing future teachers, school boards/committees, and local taxpayers. One desired result of the study is for best practices in professional development and training to be identified for school administrators, technical support personnel, tenure teachers and higher education pre-service programs. Another desired result of the study is to add to the existing body of research on teacher perceptions and pedagogy. Furthermore, it is important to understand the emerging themes of teacher perceptions of working with cloud-based technology. In developing an understanding of the implications that Bandura's social cognitive theory (1986) has on teacher self-efficacy, the theory may provide an understanding of emergent themes (positive or negative) which may pave the way for other schools interested in adopting G Suite for Education and the implications.

According to Creswell (2013) understanding a phenomenon can be used to create policies (p. 81). Current research by Sahin et al. (2016) found specific themes that impacted teacher

perceptions in using Chromebooks and the majority were due to technical issues and technical support. Furthering the mixed methods research by Sahin et. al (2016) by specifically looking at multiple core subjects and focusing on only one method of research will add to the body of research lacking in understanding a shared phenomenon. There are gaps in the current research that quantitative data are unable to report shared experiences as perceived by teachers integrating new technology. This study can be used on a wider scale for technology curriculum development including professional development, best practices, administrative supports, information technology department support, and teacher attitudes towards technology. Furthermore, Dooley, Lewis Ellison, Welch, Allen and Bauer (2016) research found the importance of technology integration professional development. This study will help K-12 institutions across the United States by making research based decisions in adopting a plan to implement GSFE and integration of 1:1 computing using Google Chromebooks.

Research Questions

The following central research questions guided this study:

Central Question: How do grade 4-8 public school core content teachers perceive the experience of using G Suite for Education with Chromebooks in the classroom?

This question sought to understand teacher perceptions of using G Suite for Education with Chromebooks. This question was designed to further develop understanding of any patterns and themes exposing the essence of teacher perceptions of using this technology. Furthermore, the goal of this question was to further understand teacher perceptions of the experience using GSFE and Chromebooks in academic core content areas to fill the gap in current research (Sahin et al., 2016).

The following sub questions were used to further guide the study:

Sub-question 1: How do grade 4-8 public school core content teachers perceive the impact of integrating G Suite for Education on teaching pedagogy?

With the integration of the Common Core State Standards it is important to understand how GSFE can be integrated in implementing these standards (Beriswill, Bracey, Sherman-Morris, Huang, Lee, 2016; Roberston, 2013;). This question was developed to further understand teacher perceptions on teaching pedagogy as it relates to lesson planning and instruction implementing CCSS.

Sub-question 2: How do grade 4-8 public school core content teachers perceive the impact of using Chromebooks in the classroom on student learning?

The goal of this question was to understand the impact the use of Chromebooks has on student learning. Although studies have been conducted on 1:1 devices such as laptops in the learning environment (Zheng, Warschauer, Lin, & Chang, 2016), there is a lack of scholarly research specifically on Chromebook devices. Sahin et al. (2016) found that Chromebooks were well received in the beginning by participants, however over time due to technical issues teacher and student attitudes diminished. The goal of this question is to further study teacher perceptions of Chromebooks' impact on student learning.

Sub-question 3: How do grade 4-8 public school core content teachers describe technology support and training integrating G Suite for Education?

This question builds upon past research (Warschauer, Zheng, Niiya, Cotten, & Farkas, 2014) on 1:1 computing that identified technical support challenges and the implications of long-term teacher professional development training (Beriswill et al., 2016). The goal of this question was to gain further insights into teacher perception of technical support and professional development using GSFE and Chromebooks specifically.

Definitions

1. *1:1 Computing* – Describes K-12 technology implementation in which every student in the school is given a device. Programs vary where the device remains at school while other programs allow students to use the device both at school and home (Bebell & O'Dwyer (2010).
2. *Cloud Computing* – Applications or services that are hosted on multiple servers through the Internet in which software and data is accessible in the web browser environment and is not managed or installed locally (Sultan, 2010).
3. *Common Core State Standards* - The Common Core State Standards (CCSS) for K-12 United States public schools include standards for English Language Arts and Math. Common Core State Standards have been adopted by 42 states with the state of Minnesota only adopting the English Language Arts (ELA) (Common Core State Standard Initiative, 2016). The standards promote college and career readiness skills (Common Core State Standard Initiative, 2016).
4. *Google Chromebooks* – A laptop style computer with a screen and keyboard that runs Google Chrome OS that is light weight, minimum storage, and runs cloud-based applications using the Chrome browser which works seamlessly with Google Drive (Miller, 2011).
5. *Google Suite for Education* – Cloud computing service that runs within a web browser that is made up collaborative creation apps and communication tools such as email, calendar, drawing, word processing, spreadsheet, and presentation applications that are free to educational facilities (Google, 2016).

6. *Infrastructure* – Connectivity to the Internet and network involving hardware and software such as servers, routers, access points, wireless, and bandwidth measured in megabits per second or gigabits per seconds delivered through fiber optic or broadband technologies (Ajamieh, Benitez, Braojos, & Gelhard, 2016)
7. *Learning Management Systems* – An online learning platform accessed through the Internet or Cloud used in both K-12 and higher education settings in which class materials are available online where teachers post information and students access the LMS to post work and other tasks through the online course (Weaver, Spratt, & Nair, 2008).
8. *Lived experience* – In qualitative research lived experiences are revealed through data collection, such as individual interviews, during which all the participants openly describe their experiences in the setting. The responses are then analyzed by the researcher through interpretative findings of words that then become a pattern of themes transcending into meanings also known as the essence of the phenomenon (Creswell, 2013; Moustakas, 1994).
9. *Mobile Computing* – The use of devices that connect to the Internet that allow for content creation and editing using the web or through applications which include tablets, smartphones, and laptops (Gikas & Grant, 2013).
10. *Perceive* – According to Moustakas (1994) and Creswell (2013), perception by an individual includes self-consciousness of inner feelings and the surrounding external world. Moustakas (1994) also describes perception as knowledge derived from experiences and senses. Furthermore, Creswell (2013) identifies perception as a viewpoint toward a given situation. Therefore, to perceive is a constructed meaning by

the study participants. The resulting meaning is formed by consciousness, internal and external environment, history, culture, and interactions with others (Creswell, 2013; Moustakas, 1994).

11. *Partnership for Assessment of Readiness for College and Careers* – Formative assessment of English Language Arts and Mathematics that measures students’ knowledge of Common Core State Standards focusing on college and career readiness (Heritage, 2010).
12. *Web 2.0* – Internet resources that run within a web browser that allow for content creation, posting, and collaboration such as blogs, social media, and collaborative tool (Daher & Lazarevic, 2014).

Summary

This study sought to understand the shared experiences and give a voice to public school core content teachers’ use of G Suite for Education and Chromebook devices. This study contributes to filling a gap in this area of research and contributes to the current research on technology integration with 1:1 devices to pave the way for other teachers and schools looking to adopt G Suite for Education in addition to purchasing and using Chromebooks. Understanding the participants shared experiences will help other educators in areas such as: planning, adoption, technical support, teaching, and professional development. In addition, educators will be able to learn from others in the field to make decisions based upon past research to develop best practices. Sahin et al. (2016) noted the experience of teachers and students using Google Chromebooks had a limited amount of study participants and a lack of multiple subject areas in the research. This study sought to fill the gap in phenomenological qualitative research giving teachers a voice to understand their lived experiences in core content subjects.

CHAPTER TWO: LITERATURE REVIEW

Overview

The review of the literature includes an overview of the theoretical framework which guided the study which included Bandura's social cognitive theory (1986) and the importance of self-efficacy and the role it has on teacher willingness to implement technology integration in the classroom. The review of the literature on related research includes G Suite for Education, Common Core State Standards, teacher attitudes towards technology, cloud computing, 21st century skills, 1:1 programs, and self-efficacy. The summary identifies the gaps in the literature and central themes in the body of research.

Theoretical Framework

This research was grounded in Albert Bandura's social cognitive theory (1986) which was derived from his social learning theory (1977). The social cognitive theory and its framework related to the focus of research in teachers' use of GSFE with Chromebooks and their experiences using this technology integrated into their instruction. Teacher's attitude and perceptions of technology and the understanding of their willingness to use technology in the classroom can be viewed through Bandura's social cognitive theory. Three main areas make up the social cognitive areas: "direct personal agency, proxy agency, and collective agency" (Bandura, 2002, p. 270). Personal, social interactions, and the environment can be recognized as areas that impact the individual's learning behavior.

The personal agency includes self-efficacy, which encourages a person to be self-directed based upon experiences. Self-efficacy relates to the research in understanding the phenomenon based upon participants' self-efficacy to integrate technology into the curriculum and environmental factors such as other teachers modeling their use of technology in the classroom

and expressing their experiences with others. In Bandura's 1961 experiment with the Bobo doll, children observed violent behavior and then when given the doll they mimicked the observed behavior. Environmental or proxy agency can be seen within the educational context especially in the area of teacher attitudes towards technology. Teachers that express their perceptions of technology can influence the environment in which they are part of, therefore creating a climate of shared attitudes toward technology integration. Self-efficacy determines one's perceptions of their learning and academic goals (Bandura, 2002). Overbaugh, Lu, and Diacopoulos (2015) found self-efficacy affects teacher implementation and the degree of technology integration into the curriculum. The shared experiences of teacher use of GSFE with Chromebooks and the exposed phenomenon may provide further implications to the theory specifically self-efficacy in implementing technology integration.

Related Literature

Google Suite for Education

G Suite for Education (GSFE), previously known as Google Apps for Education (GAFE), is a secure cloud-based storage and application service provided free to educational institutions (Google, n.d.). Google reports that there are 60 million GSFE education users and 10 million students and teachers around the world using Google Classroom (Google, n.d.). According to Futuresource Consulting (2016) the last quarter of 2015, 50% of Chromebook sales were to K-12 educational institutions in the United States. These results indicate a significant rise in the educational market by Google making them a major educational contender over Apple and Microsoft. The rise of Google's Chromebook cloud-based devices in United State educational institutions may be the result of a low-cost device, free cloud-based suite, and the ability to easily integrate collaboration within each of its core apps. Research (Pearson, 2015; Sahin et al., 2016)

found that principals studied selected Chromebooks for their schools due to their low cost, cloud-based solution, and the ability to access various online resources through one device over other educational devices. Due to the no to low cost cloud-based solutions offered by Google, other schools are adopting GSFE solutions (Roberston, 2013). G Suite for Education is a cloud-based solution that offers various applications that can be accessed for free with any Internet connection, web browser, or on any mobile device (Windows, Apple, or Android). The cloud-based solution does not require schools to spend money on specific software nor require technicians to install and maintain software on individual computers. In the education setting, GSFE is managed through what is called the Google Admin Console. The console allows for the creation and management of user accounts, services, and devices such as Chromebooks. The common applications that make up GSFE are Gmail, Google Drive, Google Docs, Google Sheets, Google Slides, Google Calendar, Google Forms, Google Drawings, Google Sites, and Google Classroom. Access to various services can be turned on and off through Google Admin Console.

Google Apps

G Suite for Education includes Google Drive, which offers free unlimited online storage of files and the ability to create a variety of documents using their apps. The convenience of GSFE includes easy access to files from an Internet connection from any device and location. Files and folders can be shared with other users with Google accounts allowing for collaboration on documents between teacher and students. Collaboration can be limited to within the school's domain, a factor which prevents users from sharing files with anyone outside of their school. Sharing files eliminates the need for attaching documents through email, flash drives, and printing documents. Not printing documents by sharing and turning in work through Google

Classroom saves schools money due to eliminating printing and classrooms going paperless.

Google's collaboration through sharing remedies the days of attaching documents with revisions through its collaboration features where the shared files appear in the "Shared with me" folder in Google Drive and include a detailed revision history.

Google Docs is a cloud-based word processor that is accessed through the GSFE account. Google apps offer a user experience of synchronous collaboration. Documents can be shared between multiple users and accessed at the same time synchronously or asynchronously. Google Docs allows for commenting that looks very much like text messages and a revision history. Access to detailed revision history gives the user access to see the changes to the documents throughout editing. Another feature of Google Docs includes the research tool that allows for web search and image searching directly within the app. In addition, Google Docs allows for Add-ons where additional functions can be installed from the Chrome Web Store. Google Slides is a slide presentation application similar to PowerPoint that allows the user to create slides and collaborate with other users. Google Sheets is a spreadsheet program similar to MS Excel that also allows for collaboration. Google Forms is an application that can be used to create surveys and self-grading assessments that link to Google sheets which allows for further analysis. Google Drawings is a paint program that can be used to draw, insert images, create annotation, and design mind maps. Google Calendar also takes advantage of collaboration allowing educational users to create reservation systems for various resources such as booking Chromebook carts, sharing calendars, and creating appointments.

Google Classroom is similar to a Learning Management Systems (LMS) and works seamlessly with student and teacher Google Drive accounts. Google Classroom allows teachers to post announcements, questions, and assignments. Students easily join their classes using a

provided code which eliminates the need for a teacher to manually add each student to their class roster. Students access their assignments and open teacher created documents, instructions, and turn in their work directly within Google Documents or adding a file directly within Google Classroom. Teachers automatically know how many students have turned in an assignment and can verify who has not turned in an assignment in Google Classroom. In addition, teachers can open and comment on assignments and return them to their students for further revisions or simply return the document and grade it. The ease of the program eliminates hours of searching the shared with me folder finding student assignments from various classes. Google's application for their Google for Education suite offers students and teachers a well-rounded experience is seamless computing and tools through one account.

Google Chromebooks

Google Chromebooks operate using Google's Chrome OS, requires a Google account to sign-in, and are very low-priced devices. Chromebooks do not require any software installation since they access everything from the cloud through a user's GSFE account. Chromebooks automatically update and do not require anti-virus software. They require little technical setup and are managed through the Google Admin Console. Chromebooks in the school setting do not require a student to use a specific Chromebook; they can use any Chromebook and sign-in with their account to access their work. In order for students to sign-on to Google Chromebooks, they need to log in using a GSFE username and password created by the school which gives each user access to GSFE apps such as Drive and Google Documents. Chromebooks eliminate the need to purchase expensive desktop computers and setup computer labs. Chromebooks can be used within the teachers' classroom.

The free suite of apps and use of the low-priced Chromebooks may be the choice of many schools; however, schools need to use educational research in order to properly plan for adopting G Suite for Education and Google Chromebooks. A recent mixed methods study (Sahin et al., 2016) of teachers' experiences using Chromebooks gives important insights to the use of Chromebooks in the classroom. The study found that teacher attitudes towards Chromebooks became negative after one school year (Sahin et al., 2016). The qualitative portion of the study revealed the first theme to be "Concerns" followed by sub-themes "restrictions, disappointment, technological problems, distractions, and disappointment" (pp. 369-370). The second theme and sub-themes included "Recommendations: careful monitoring, proper training, not blocking but filtering" (pp. 371-372). The key issues faced by the teacher participants were all technical in the setup of access to websites, for it was reported that the majority were blocked. Due to the websites being blocked, teachers and students were unable to complete online research. Additional feedback on the use of Chromebooks included not being able to print, slow wireless connection, Chromebook durability, and the length of time it took their tech department to repair them (Sahin et al., 2016). The technology department plays an important role in teacher experiences in using the Chromebooks. Teacher participants noted that students were distracted using the Chromebooks and were accessing content that was not part of the lesson and expressed they had difficulty in getting students to turn in their work electronically versus paper (Sahin et al., 2016). Although Sahin et al. (2016) reported that teachers and students were excited about the Chromebooks when they first received them, their attitudes changed overtime to be negative due to technical issues of not being able to access online resources. One of the main reasons for the failure of the yearlong initiative was technical issues due to reported websites being blocked. Websites being blocked have nothing to do with the teacher for it is a technical issue of

infrastructure setup. Teacher participants recommended proper training on Chromebooks and students being trained in areas of behavioral expectations when using devices and digital citizenship (Sahin et al., 2016). In reviewing the study, all aspects of negativity were related to lack of proper technical setup and support. The Leary et al. (2016) research found that in a class that had access to Chromebooks, students would prefer a Chromebook over their Kindles that they were using prior to the study. It was noted that the reason why students preferred the Chromebooks over other mobile technology was due to the screen size, keyboard, and access to GSFE (Leary et al., 2016).

A major implication suggested from the qualitative portion of existing research (Leary et al., 2016; Sahin et al., 2016) in regard to Chromebooks includes the need for proper technical support and setup prior to distributing Chromebooks. Technical support and setup is resonated in Sahin et al. (2016) research where teacher and students relied on Chromebooks and they ran into multiple hardware and infrastructure issues that plagued the integration of technology in teaching and learning. In addition, schools need to consider providing enough Chromebooks for an entire class population in order to avoid unavailability or access issues when using carts instead of 1:1 programs. Schoenbart (2015) discusses the multiple ways in which Chromebooks are an effective tool in the classroom. Among the implications of the uses in the classroom, Schoenbart (2015) notes Chromebooks a) have a fast startup and allow for students to access all their work through GSFE with one login; b) allow for students to work at their own pace; and c) Google Classroom can be used to manage assignments and be used by students to access additional content or catch up on their work. Although other devices can be used to access online resources, the Chromebooks in the classroom allow students to focus on their work with less down time waiting for a conventional PC to startup and the technical issues that follow stand-alone

computers. Scholarly research on Chromebook devices in the educational setting continues to be scarce.

Common Core State Standards (CCSS)

The Common Core State Standards (CCSS) for K-12 United States public schools include standards for English Language Arts and Math. Common Core State Standards have been adopted by 42 states with the state of Minnesota only adopting the English Language Arts (ELA) standards (Common Core State Standard Initiative, 2016). The remaining six states that have not adopted the CCSS are: Nebraska, Indiana, Virginia, South Carolina, Oklahoma, and Texas. The standards promote college and career readiness skills that adopt the integration of technology as part of many of the standards. Specifically, in English Language Arts, the Common Core Standards Career and College Readiness Anchors outline specific standards that address technology integration such as in writing. “Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others, CCSS.ELA-LITERACY.CCRA.W.6” (Common Core State Standards Initiative, 2016). In order to meet these standards, curriculum and unit development can integrate the use of cloud computing. Google Suite for Education promotes its sharing features for its ease in collaborating on documents (Google, 2016).

California’s implementation of CCSS prompted the Anaheim City Schools to adopt GSFE. According to Robertson (2013) in reviewing their technology such as hardware and software needs based upon the expenditures, the school system decided to select a cloud-based solution and selected GSFE over Microsoft based upon the free cost, future device implementation, and collaboration tools. Teacher use of GSFE increased teacher collaboration as part of preparing curriculum that adopted the CCSS (Robertson, 2013). Multiple Common Core

anchor standards implement student use of technology. These standards can be found within English Language Arts, the categories of "reading, writing, comprehension and collaboration, and writing" (Common Core State Standards Initiative, 2016). In order for these standards to be met, teachers need to instruct and design lessons that implement these standards. In addition to ELA, math and other content areas that integrate writing such as social studies have standards as well that implement technology integration. Teachers need to have a formal understanding of how to use technology, implement technology in the classroom, as well as the content and pedagogical skills for designing lessons. In addition to the content and pedagogical skills teachers need to be able to formatively assess project-based learning. In looking at the multiple standards that integrate technology specifically in ELA, the Common Core state standard, "CCRA.R.7 calls for students to use various media to synthesize and present their ideas" (Common Core State Standards Initiative, 2016). The writing standard "W.6" identifies students publishing their work online in addition to collaborating with others (Common Core State Standards Initiative, 2016). If teachers are unaware of the tools and resources available to them to integrate these standards they will not be able to meet the identified standards that integrate technology. Current research on K-12 environment using cloud computing suites to meet Common Core State Standards is very limited. Yim, Warschauer, Zheng, and Lawrence (2014) mixed methods study found that in schools that previously implemented a 1:1 netbook program, students and teachers had a positive attitude towards the adoption of G Suite for Education. The qualitative document collection revealed Google Docs commenting and sharing tools allowed students to give peer feedback and create revisions which implemented Common Core state writing standards for collaboration (Yim et al., 2014). In addition, professional development was offered to the teacher participants specifically on technology integration in their specific content

area such as ELA (Yim et al., 2014). Robertson (2013) identified that the use of GSFE allows for ease of implementation of Common Core State Standards. In identifying technology that allows for teacher implementation of technology standards, Google Docs specifically has sharing capabilities to increase student collaboration which meets the CCSS.

There is a gap in research on recent technology due to it quickly changing over time (Roberts, Shedd, & Norman, 2012). According to Roberts et al. (2012), pre-existing technology that is still widely used currently can be implemented as a tool in meeting multiple Common Core standards as adopted by various states. In order to meet the standards that call for technology based learning experiences current technology such as online research with validation techniques, social media, and blogs can be integrated (Roberts et al., 2012). Social media and blogging allow for students to post their writing which meets the various standards for writing through publishing work, online collaboration, saving of work, and meeting the typing standard. However, the dilemma occurs for teachers on the type of tool to use and how to use it in order to meet student 21st century skills as well as training and pedagogy (Herro, Kiger, & Owens, 2013; Saine, 2013).

The push for college and career skills has resulted in core content standards that implement technology integration that has resulted in the need for teacher to know both their content and how to use technology in teacher and learning. According to Drew (2012), fiscal funding was received for schools adopting CCSS. In addition, Howell (2015) notes that billions of dollars for schools were granted for recipients of Race to The Top (RtTT) grant created by the Obama administration. Furthermore, the initiative has been found to have influenced many states education policies according to Howell (2015). Grants offer schools the ability to have increased technology access for students and teachers. Saine's (2013) study on CCSS in ELA found that

students' implementation of ELA standards was accomplished through a variety of various learning experiences. Saine (2013) notes that various grants which included RtTT allowed the researched schools to provide professional development, addition technology, and extended access to resources (P. 102). Although grants can be essential in equipping schools with technology and infrastructure demands of today's technology the teacher plays an important role in the acceptance of the technology and the usage of it. Research has found the importance of pedagogical and content knowledge in applying technology integration into lesson planning (Mishra & Koehler, 2006).

Collaboration

K-12 and higher education institutions are adopting the cloud-based computing using Google Docs to meet the needs of collaboration as well as increasing writing and literacy skills of their students (Brown & Hocutt, 2015; Robertson, 2013). The use of collaboration tools in Google Documents enhances student writing and teacher collaboration (Brown & Hocutt, 2015; Robertson, 2013). Higher Education institutions are utilizing the various cloud-based apps in graduate programs to study the impact it has on collaboration as well as active learning and instruction, by integrating the Google suite such as Drive, Documents, Slides, Hangouts, and Google plus (Holmes, Tracy, Painter, Oestreich, & Park, 2015). The reports and studies (Holmes et. al., 2015; Robertson, 2013) of GSFE were mixed methods approaches of both quantitative and qualitative reports of participants shared experiences using the free education based suite offered to K-12 and Higher Education facilities to enhance collaboration and active learning.

Brown and Hocutt (2015) studied community college student perceptions of GSFE specifically Google Drive and Google Documents in composition courses. The mixed methods approach measured student attitudes towards GSFE and usability from account sign-on,

interface, and using specific aspects of Google Documents. Brown and Hocutt (2015) reported positive student feedback to specific features of GSFE such as the commenting ability in Google Documents and sharing documents. The quantitative portion of the study found sharing and commenting improved the student writing process (Brown & Hocut, 2015). Both studies mention Google services; however, Sahin et al. (2016) does not report on the specific use of GSFE and only mentions websites being blocked. It is not clear if the teacher participants in the study used any of the GSFE or solely used the Chrome browser to access websites.

Community college students using Google Documents as a collaboration tool to improve writing skills were found to have a positive attitude towards GSFE (Brown & Hocutt, 2015). Brown and Hocut's study did not include a study with Chromebook devices and only focused on Google Docs. Collaboration is easily met through the use of a Google Doc where students collaborate in the writing process. Liu and Lan (2016) found that student participants using Google Docs in their study were more motivated and had an increase in their learning than those students that did not use Google Docs. Yim et al. (2014) found that Google Docs has the capability of meeting the collaboration standard. The study included various levels of collaboration and found that the collaboration that did occur did not extend beyond grammatical feedback on fellow student writing (Yim et al., 2014). The collaboration feature of Google Docs offers the ability for teachers to meet the Common Core State Standard in preparing students for college and career readiness through interaction and collaboration. In addition, the collaboration process of Google Docs integrates social constructivism where students learn from each other through the collaborative writing experiences. Suwantarathip and Wichadee (2014) experimental study found that students that used Google Docs collaboration tool had higher writing scores than those not using Google Docs in addition to students having a positive perception about

Google Docs for collaboration. Higher education faculty are finding the tools found in Google Drive to enhance instruction and learning through Google Docs revision history which assists the professor in identifying areas students can work on in the way they revise their documents in addition to students completing their assignments by seeing what others have written through shared documents (Cotugano, 2014). G Suite for Education is creating a new way in which teachers and higher education faculty are shifting their instruction to implementing tools that are preparing students for increased collaboration as education shifts to 1:1 computing, flipped classroom, blended learning, and online learning. Higher education teacher programs need to implement best practices in using technology to a specific content area. Hughes (2013) study found that pre-service teachers that graduated from a 1:1 laptop pre-service program still did not have the pedagogy and content knowledge needed to implement future technology. The integration of the Common Core State Standards in the K-12 environment increases the need for pre-service teacher programs and veteran teachers to receive education and professional development in content area and pedagogical strategies for implementing any type of technology. Yim et al. (2014) and Brown and Hocutt (2015) studies found that student writing skills had a positive increase using Google Docs. Liu and Lan's (2016) quantitative study on collaboration, Google, and constructivism reiterated the need for qualitative studies to further investigate collaboration and its impact on student learning.

Teacher Attitudes Towards Technology

Teacher attitudes towards technology play an important role in teacher acceptance and desire to use technology as part of their instruction and creation of student learning experiences. One current study found student and teacher attitudes were negative due to the setbacks that were undertaken using Chromebooks (Sahin, et al., 2016). The mixed methods study employing

phenomenological method for the qualitative portion reported negative teacher and student perceptions over time due to a inconsistent training and technical support. It is important to note that professional development only occurred as an overview and was not over an extended period (Sahin et al., 2016). Over a decade ago Christensen (2002) studied teacher attitudes and the impact of technology integration training. The findings reported student attitudes increased when their teacher's attitude increased. Teacher attitude increase was due to receiving long-term technology integration training. Technology integration training for educators continues to this day to be presented as a major theme in various studies (Brown & Hocutt, 2015; Overbaugh et al., 2016; Sahin et al., 2016;). Sahin et al. (2016) research participants relied on Chromebooks and they ran into multiple hardware and infrastructure issues that plagued the integration of technology in teaching and learning. Based upon Yim et al. (2014), identification of using 1:1 devices prior to implementing Google's cloud-based computing is an important finding for schools looking to adopt a whole cloud-based computing solution with 1:1 devices. Google Chromebooks create a challenge for technical staff, for the devices cannot be accessed unless a user has been setup with a school based Google account. The technical support staff must create and manage accounts for each user unless the guest feature option setting has not been disabled. Furthermore, schools need to provide training on how to use the Chromebook in addition to G Suite for Education all at once. Shapley, Sheehan, Maloney, and Caranikas-Walker (2011) reported an increase of student collaboration in the 1:1 environment in addition to a reduction of student discipline issues.

Barriers. Although there is a lack of literature specifically on teacher use and beliefs in using GSFE and Chromebooks, examining other resources and devices that have been established and adopted by educators may help with gaining insight into teacher adoption of

other new technologies. Past research has identified two main barriers to teacher adoption and integration of technology which have been identified as external and internal barriers (Ertmer, 1999). The external barriers in technology acceptance have been described as access to technology and training on how to use the technology (Ertmer, 1999). In addition, the internal barriers have been identified to be more intrinsic having to do with teacher beliefs and pedagogical approaches (Ertmer, 1999). Teacher adoption and beliefs about technology continue to be a relevant theme today with researchers in identifying the effects of teacher beliefs on technology integration where epistemological belief have been found to have a relationship to teacher integration of technology (Kim, Kim, Lee, Spector & DeMeester, 2013).

A gap continues to evolve in identifying why some teachers instantly accept technology and make it a part of their daily instruction while others do not integrate technology at all. Furthermore, Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur's (2012) update to an earlier study (Ertmer, 1999) reconfirms that external barriers still have an effect on technology integration even for those teachers that are considered to be at high levels of technology integration in their classrooms. In addition, technology access issues have been identified as lessoning where teachers have access at school and home and the majority of classrooms having a computer with Internet access (Ertmer et al., 2012). Over a decade later, acceptance of technology barriers continues exist. The top three barriers in research were identified as, "attitude and beliefs of other teachers, technology support, and state standards" (Ertmer et al., 2012, p. 428). Past research indicated that teachers were not integrating technology in the classroom even with access to computing devices (Cuban, Kirkpatrick, & Peck, 2001). Present studies seek to understand the barriers and the effects they have on implementing technology into the classroom (Ertmer et al., 2012). Ertmer et al. (2012) has noted that the barrier once defined as

limited access to technology has diminished; however, barriers to integrating technology still exist. The use of a technology integration framework may be helpful for teachers to understand how technology can be used in a lesson to meet content standards in addition to developing assessments. To assist teachers with integrating technology into the curriculum, a framework was developed by Koehler and Mishra (2006) known as the Technological Pedagogical Content Knowledge (TPACK). The TPACK helps teachers develop learning situations that integrate technology with their current pedagogical knowledge. The TPACK framework can be used to help teachers develop lessons that integrate technology, create assessments, selection of technology tools, and content knowledge. The model eliminates selecting the technology first and applying it to the content, it first begins with the content and pedagogical knowledge and then the selection of the technology tool Koehler, Mishra, & Cain, 2013).

Technology leadership. Multiple barriers have been identified such as external barriers which includes the environment's culture. When dealing with school culture, it is important to understand the leadership and its role in technology adoption. According to Machado and Chung (2015), principals play an important role in technology integration which can be affected by vision setting. In addition, the study found that principals do not realize their influence in technology adoption and the importance of a technology plan (Machado & Chung, 2015). Principals indicated that teacher willingness and professional development were barriers to technology integration (Machado & Chung, 2015). The researchers included information about technology coaches; however, principal participants did not have the funds to pay for teachers to work additional hours assisting peers. Perhaps principals are not aware of research (Lowther, Inan, Daniel Strahl & Ross, 2008) that indicates the positive impact of technology coaches. Bleakley and Mangin (2013) present a school administrator's struggle in working with teachers,

parents, and students in creating a technology plan. Arriving at a consensus was a difficult task due to stakeholder perspectives of what technology should look like in the school. One area that has not been mentioned in previous research as a barrier is teacher union influences on teacher willingness to integrate technology. In the case study, the administrator noted past resistance to technology adoption due to union beliefs that they would become responsible outside of the school day due to access to student records and lesson planning becoming available online. McLeod (2015) notes in most classrooms, technology integration is being completed at a low level where it is just substituting a task that was done without technology which is not a student-centered approach. Low level of technology integration would be students typing a document in a word processor; this is an example of low level integration. In addition, pre-service programs have been found as a source to assist student teachers to become comfortable with technology integration. McLeod (2015) notes leadership programs need to include technology integration training for future administrators. In addition, McLeod (2015) specifies that administrators should use an inquiry based lesson planning tool for teachers to use to create relevant technology integration learning experiences. The Yu and Prince (2016) study found that principals reported that they needed professional development in order to meet ISTE administrator technology standards.

Berrett, Murphy and Sullivan (2012) research of a technology grant and administrators' role in the grant revealed that principals are in need of technology facilitating professional development. The study reveals that there was a lack of communication among fellow administrators in the various schools in the district which outlined the importance for communication with technology initiatives. In addition, some principals in the study placed too much responsibility on teacher coaches or the technology integration specialist which resulted in

the technology integration specialist having to deal with more technical support issues than technology integration (Berrett et al., 2012). The principal as the technology leader has been identified to have a positive effect on teacher technology integration; however, revealed in other research principals feel it is the computer teacher's role to promote technology integration (Cakir, 2012). Berrett et al. (2012) research reveals that school culture, technology leadership, and training for administrators is just as important as it is for teachers (Berrett et al., 2012). Administrators promoting the use of technology devices and 1:1 programs first need to begin with setting a vision, creating a technology plan, communicating between all school district administrators, hiring technology mentors or integration specialist, attending technology training, using technology themselves, and designing protocols to assess technology usage in classroom (Berrett, Murphy, & Sullivan, 2012; Bleakley & Mangin, 2013; Lowther et al., 2008; Machado & Chung, 2015; McLeod, 2015). In addition, all these multiple variables need to be integrated into the leaders' "tool belt" in order to have a successful adoption of technology into their schools. These are example of barriers and solutions that school leaders face or can implement when promoting technology integration. The ISTE administrator standards provide a roadmap that includes vision setting and modeling (ISTE, 2009). Furthermore, there is a gap in research specifically focusing on the principal's perceptions of technology integration using GSFE and Chromebook devices.

Cloud Computing

Cloud-based computing is a technical term for accessing files and applications through an Internet web browser without having to install software locally and where files are saved to an online account that can be accessed at any time from any supported device. The cloud-based computing environment provides users with access and collaboration to documents from school

and home using multiple devices for mobile to traditional laptops with Internet connection. Multiple schools and universities are switching to cloud-based solutions due to the cost savings and reduction of IT spending for technical support and upkeep (Dessoiff, 2010). Email servers that are maintained on site are no longer needed with various cloud computing solutions. Many schools have switched to cloud solutions such as Oregon schools selecting Google saving over a million dollars and Kentucky utilizing Microsoft reported to have saved over six million dollars (Dessoiff, 2010). The implications on savings and reduction of IT hardware, subscriptions, and supports are considerable and may explain why Cloud computing continues to grow.

Cloud computing in the higher education environment introduces future educators to the collaboration and project creation tools that can be implemented in the classroom. According to Denton's (2012) case study involving graduate education students that were introduced to various Google apps that integrated constructivism through being presented with apps and assignments that resulted in content creation and collaboration teachers were able to identify the uses in their own classroom. The case study implications found that graduate students were able to relate how the various cloud computing tools could be applied to and integrated into their classrooms as well as the implications on pre-service training. The author identified that the integration of cloud computing and constructivist approach to learning may lend to teacher willingness to integrate cloud technology into their classroom when used as part of teacher training programs (Denton, 2012). Cloud computing adoption in the higher education environment may play an important role for pre-service teaching programs in creating the desire for pre-service teachers' willingness to use these various tools in their own lessons based upon previous research (Denton, 2012).

Security. Cloud computing offers the ability to access data and applications from different locations and from various computing devices through the Internet that is maintained by a provider off site. There are four different cloud services known as CaaS Computing as a Service, Platform as a Service (PaaS), Software as a Service (SaaS), and Infrastructure as a Services (IaaS) (Isalia, 2014; Patrignani & Kavathatzopoulos, 2015). Software as a service offers access to applications and data storage through a web browser connected to the Internet where the program runs through the web browser and all information is saved off the computer onto company's cloud service such as GSFE (Mathew, 2012). Companies are offering educational facilities free services to data storage, email, content creation applications, and collaboration. Access to free services that are maintained off site that reduce IT maintenance of hardware, software, and email are described as the main selling features of cloud computing.

Security is a topic of concern in regard to cloud computing with the data being stored online and access to privacy (Isalia, 2014; Patrignani & Kavathatzopoulos, 2015). Literature reveals that cloud service data may be stored in other countries, loss of data if the systems were to fail, personal information not secure, and the ability for the data to be copied (Isalia, 2014; Patrignani & Kavathatzopoulos, 2015). With cloud computing being so new to K-12 educational facilities and cost saving features the security behind the technology may not be in question or realized. Potential risks of student information known as Personally Identifiable Information (PII) may be at risk due to data mining which brings into question policies and laws to protect student data (Weber, 2016). Existing privacy acts exist to protect student information such as Family Educational Rights and Privacy Act which protects student records and Children's Online Privacy Protection (COPPA) which was created to protect the privacy of children under 13 where their information cannot be collected. Although preexisting acts and amendments exist

Weber (2016) notes the importance for updated federal laws to be enacted in order to protect the privacy of students from large data mining that could potentially reveal PII. According to Weber, at one-time Google's GAFE was scanning student emails which resulted in a law suit (2016, p. 68). Weber (2016) recommends updated laws to protect student privacy due to the increase of cloud computing.

Bandwidth. Cloud computing offers various services which also includes learning management systems (LMS). Learning management systems have changed the way course content is being delivered from the traditional classroom to online learning. Not only is higher education using LMS as part of their online offering but K-12 schools are using LMS as well. Learning Management Systems utilizing cloud technologies include Moodle and Blackboard. K-12 schools use LMS as part of course content utilizing the flipped classroom approach, credit recovery, and blended to online public schools (Jacobs, 2016; Kostaris, Sergis, Sampson, Giannakos, & Pelliccione, 2017; Weber, 2016). Research has identified that the themes of cloud computing in the educational environment include the ability for students to access work outside of the classroom, ease of content creation by the teacher, ability to access files from various devices, and the ability to access the same applications from anywhere without cost (González-Martínez, Bote-Lorenzo, Gómez-Sánchez, & Cano-Parra, 2015).

Although schools are beginning to implement cloud computing services to cut operating costs of technology, a new expense and challenge arises which deal with network connectivity issues. Infrastructure needs to be considered based upon the number of users and devices connecting the Internet. Koch, Assuncao, Cardonha, and Netto, (2016) note that there are times during the school day where there will be more demand on the network when classes are accessing multimedia which will affect the performance and connectivity speeds (Koch et al.,

2016). In addition, bandwidth use needs to be considered when planning cloud-based services and supporting the integration of various devices, 1:1 programs, and Bring Your Own Device (BYOD) initiatives (Marcoux, 2013) which are all dependent on the network. Furthermore, if the bandwidth is not enough, then the internet drops or slows down, and connectivity issues occur. Marcoux (2013) notes the importance of infrastructure reliability in the classroom and the effects it has on those trying to access the network when it goes down and is not available; that becomes frustrating. This is a very important factor when planning lessons that use the Internet for if it becomes unavailable, then the teacher is unable to carry through with the lesson and will need to have an alternative plan in place. Sahin (2013) noted that a study participant noted barrier to technology integration was due to bandwidth. In addition, If the network goes down access to platforms, applications, data, and student information systems will not be available—affecting day to day operation in addition to teaching and learning. As educational facilities look to cost saving solutions through cloud services, it is important to understand bandwidth infrastructure needs and user privacy issues which includes understanding end user agreements terms and storage security (Koch et al., 2016; Marcoux, 2013; Weber, 2016).

The Federal Communications Commission (FCC) has an E-Rate program that helps schools, in particular those servicing poverty areas with offering reduced rates in Internet access and infrastructure so all schools have access to the Internet (FCC, 2016). The Universal Services Administration Company (USAC) has placed aside 3.9 billion dollars in funding as of 2015 to assist schools with Internet access needs with one billion in funding for assistance with wireless technologies funded by the universal access fee found on phone bills (FCC, 2016, p. 2). In order to receive financial discount assistance schools must meet a set of criteria in order to qualify. According to the FCC (2016) due to the E-Rate program every school and library has Internet

access. Internet access and infrastructure upgrades have been impacted by federal programs as well as Common Core State Standards and high stakes testing taking place on the computer.

Technology plans for improving teacher use and acceptance of technology in schools has been identified as one of the solution amongst many (Hew & Brush's, 2007). Hew and Brush (2007) recommend that technology integration plans include a shared vision with all stakeholders including a community member to be involved in the process in order to resolve external barriers. In the past, E-Rate required schools to submit a technology plan as part of the application process; however, it is now only required for one specific service (Universal Service Administrative Co., 2016). Creation of a technology integration plan that includes direct connection to standards and curriculum content may reduce internal and external barriers to technology adoption as defined by Ertmer et al. (2012). The Department of Education's National Education Technology Plan calls for schools to have an infrastructure to meet current and future demands, learning situations that incorporate technology integration, and access to Internet connected devices (U.S. Department of Education, 2017).

Web 2.0. Access to the Internet continues to be of importance as more resources from software to data become only accessible online. Specific applications online that can be integrated into the classroom that do not require any software to be installed locally and accessed through a web browser are Web 2.0 websites. Access to the Internet and a web browser is all that is needed to have access to new tools available online. Teachers are able to access online resources that incorporate technology tools for content creation and posting. Examples of Web 2.0 resources include websites that allow for posting of information as well as content creation. Examples of such resources include video creation using WeVideo and Animoto, keyboarding sites such as TypingClub, mind mapping tools using Bubbl.us, and many more that allow for

teachers to incorporate multiple digital tools into the learning environment. Furthermore, social media is considered to be a Web 2.0 technology as well as collaboration tools found in Google Documents (Daher & Lazarevic, 2014). Higher education faculty are using some Web 2.0 tools more than others such as YouTube and Google Docs; however, tools such as social media were rated low for technology integration (Daher & Lazervic, 2014). Understanding higher education professor use of tools offers a glimpse as to what pre-service teachers are being exposed to in terms of technology integration. According to Daher and Lazervic (2014) research participants that were professors listed barriers to using technology due to lack of professional development and technology support. These barriers are consistent with past research examining K-12 teachers use of technology and beliefs (Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010). The use of Web 2.0 technology resources in the classroom offers a variety of free technology resources that can be implemented for collaboration and content creation. According to Palaigeorgiou and Grammatikopoulou, study teacher participants using Web 2.0 with their classes found that these tools benefited their students for they were engaged, had the opportunity to produce their own content, and collaborate with others (2016). Online content creation with project-based learning changes the way a teacher typically instructs from teacher led to student centered teaching. In allowing students to create their content to solve a problem, the teacher becomes a facilitator in the learning processes, a factor which integrates constructivist learning theory in the classroom. Content creation and collaboration are part of the Common Core State Standards in which Web 2.0 online resources with cloud computing can be used to meet these standards. Pre-service teacher attitudes toward Web 2.0 technologies found that they would

integrate technology if it engaged students, met the needs of digital natives, and resources being available outside of the classroom (Sadaf, Newby, & Ertmer, 2012).

21st Century Skills

Lowther et al. (2008) note that classroom instruction continues to be teacher-led and not student-centered. Student-centered teaching practices include the design of lessons that implement project-based learning (PBL). In creating problem based lessons by integrating PBL, students engage in a variety of learning situations such as critical thinking to solve problems, group work in working collaboratively, research, and reflection (Kokotsaki, Menzies, & Wiggins, 2016). Student-centered teaching places the focus on the student to solve problems while the teacher acts as a guide. Students are entering the workforce with a lack of 21st century skills even after local and national grants, policies, funding which has been focused on providing schools with the tools needed to create 21st century skilled students (Lowther et al., 2008). The Partnership for 21st Century Learning framework includes student outcomes which one of the outcomes includes four skills under the “Learning and Innovation Skills” (Partnership for 21st Century Learning, 2016). These four skills are defined as: critical thinking, communication, collaboration, and creativity (Partnership for 21st Century Learning, 2016). Higher order thinking skills which employ creativity can also be found in Bloom’s taxonomy. Furthermore, each on these skills can be planned and become part of the PBL experience. In addition, a qualitative study found that addressing standards for producing creative content is more easily attained in ELA than in STEM content (Guo & Wouflin, 2016).

The state of Tennessee launched a technology initiative as a solution to overcome key barriers to technology integration with a multiyear quasi-experimental study (Lowther et al., 2008). The study identified common barriers to technology integration such as funding for

technology, support for teachers, and knowledge of lesson development with technology. The study found that when these barriers were addressed teacher beliefs changed as well as their pedagogy and integration of technology in comparison to the control group (Lowther et al., 2008). The remedies to the barriers included one particular element that was used to address three of the five barriers which included a technology coach (Lowther et al., 2008). The coaches' role included offering individual support in the areas of creating lessons, promoting technology, and support (Lowther et al., 2008). These findings are consistent with other studies that look at the role of teacher technology coaches, mentors, or technology facilitators and the important role in technology adoption (Stanhope & Corn, 2014). According to Stanhope and Corn's (2014) study, positive results occurred when there was a technology facilitator, teacher attitudes increased as well as increased integration of technology. In addition, the role of a technology coach has been defined by several standards created by the International Society for Technology in Education (ISTE) for technology coaches to follow in their practice. These practices include promoting technology, modeling with technology, and providing professional development (International Society for Technology in Education, 2017).

One-to-One Programs

Creativity and the ability to integrate learning experiences where students are engaged and motivated to use technology may be found in new technologies such as mobile devices. Since Chromebooks are a newer form of technology there is a gap in research; however, looking at other devices such as tablets and 1:1 programs may reveal similar experiences and teacher attitudes with other technology as it becomes introduced in the educational environment. Although according to Pearson (2015) only 19% of schools use 1:1 programs which is higher in middle and high school levels than in elementary. Various schools have implemented tablets into

the learning environment. Tablets, if not part of a 1:1 program, are typically in a cart or a certain number are given to a classroom where the device stays in school or in a classroom. One-to-one programs differ in that each student receives a tablet that they use at school and at home and keep it with them and bring it to their various classes throughout the day. Liu et al. (2016) conducted a one-year study that revealed that some teacher participants had concerns about connectivity, device access, as well as time for planning, and apps to use when using the tablets. These same barriers are similar and consistent with previous research on teacher barriers not specific to a device that include pedagogy and attitudes affecting integrating technology (Ertmer, 1999; Saine, 2013; Herro et al., 2013). Although challenges were revealed in using the tablets, the study found elementary school teachers to have a positive attitude towards Apple iPads in learning (Liu et al., 2016). According to Pearson's 2015 study of over two thousand students "72% of students would like to have an increased use of mobile technology in their learning at the elementary level" (2015, p. 8). (In addition, a multiyear and multisite study found that part of the data revealed that an increase in test scores occurred for those using netbooks than those students using tablets in the 1:1 study (Williams & Larwin, 2016). Further investigation is needed to research the variables as to the differences between devices and instructional delivery. Flower found that Apple iPads had a positive effect on learning for students with disabilities and that both teachers and students had positive perceptions of the device (2014). Although there are limited studies on smart phone use in the K-12 classroom Chiu and Churchill (2016) found teacher perceptions to vary by content at the high school level. Math and science teachers were more willing to use mobile devices in their classroom and that they had a positive attitude once it was implemented and were able to use it as part of their instruction. Humanities teachers had difficulty with integrating mobile devices into their curriculum and their beliefs toward

technology did not change with the use of mobile devices (Chiu & Churchill, 2016). The study findings are important for they reveal that technology acceptance and beliefs vary by subject matter.

Student perceptions. The integration of devices in schools is on the rise and the difference between the devices as well as student perceptions may help school leaders gain insight into the type of technology that is embraced by teachers. Furthermore, Pearson's large-scale study found that, "78% of elementary students use tablets regularly in school and 83% use laptops to complete their work" (2015, p. 9-10). Students prefer large screen tablets to other devices and elementary school students use and own tablets the most, with middle to high school age groups with the highest ownership of smartphones; high school students would like to use smart phones as part of classroom learning (Pearson, 2015). Although students are motivated by technology, the teacher plays an important role on student perceptions of technology as well. Teacher attitudes toward technology affect their students' attitudes toward technology. Secondary female teachers' negative attitudes towards science and technology has a trickledown effect to their female students as opposed to male teachers with a more positive attitude toward the subjects (Denessen, Vos, Hasselman, & Louws, 2015). In addition, research has found that family members that have a technology position their children have a more positive attitude towards technology (Ardies, De Maeyer, Gijbels, van Keulen, 2015). Both studies reveal a decline in female student perception of technology entering their high school years (Ardies et al., 2015; Denessen et al., 2015). Attitudes and adoption of technology are also influenced in the educational environment by teachers that have multiple devices at home. Teachers that own

multiple devices have been found to be more likely to integrate technology into the curriculum (Sahin et al., 2016).

Professional Development

Walker et al. (2012) found teachers that receive professional development that includes both technology skills and project based learning content opposed to professional development that incorporates technology skills only found positive effects on technology integration. The Overbaugh et al. (2016) research supports the findings that long-term professional development in technology integration increased teacher attitudes and proficiency in developing technology integration in the classroom consistent with studies (Christiansen, 2010; Li, 2007) finding the need for student, teacher, and administrators voices to be heard when adopting technology. Li (2007) found teachers were opposed to integrating technology due to the fear of being replaced by computers and thinking that students that had learning needs could not use computers. Students in Li's (2007) study were motivated to use technology; however, the teachers were not. A participant in the study that changed their view towards technology also changed their teaching to a constructivist approach where teaching became student centered and the teacher became the facilitator of learning. The new Common Core State Standards in writing and literacy adopt the constructivist theory in learning where it becomes student centered and social. Close to a decade later, K-12 public schools in 46 states, have adopted CCSS to prepare students for college and the workforce by creating learning standards requiring teachers to implement technology into their pedagogical practices; however, lack of technology integration into professional development continues to be an issue. Current research (Yim, et al., 2014) notes that K-12 schools looking to implement cloud computing into their environment should provide teachers with proper training and support. Cuban (2009), in a study he conducted many years ago

in Silicon Valley, noted the money spent on technology, but with little teacher use, underscores the “oversold and underused” perception. It is important to continue to study and understand teacher perception of technology now that smartphone devices and tablets are in the majority of people’s hands and technology is being used on an everyday basis by the young and old. The challenge for schools is keeping up with student’s daily use of technology and integrating that technology in motivating ways to enhance student learning. Cuban (2009) has been cited thousands of times regarding research on teacher attitudes and acceptance towards technology.

Self-efficacy. Self-efficacy theory as found in Bandura’s (1977) social cognitive theory, makes note of the role self-efficacy has on self-direction of personal goals. Self-efficacy plays an important role in higher education institutions teacher preparation programs. Higher education institutions’ pre-service teacher training programs can have an impact on equipping future teachers on implementation of technology in their practice. Teacher training programs can impact their pre-service teachers through providing the pedagogical skills and technology knowledge to implement technology into their classroom (Abbitt, 2011). Worch, Li, and Herman’s (2012) study found that pre-service science teachers that were part of a control group in receiving technology integration training had significant gains in outcome expectancy and self-efficacy. The implications of the study show that developing content specific training in the subject and the types of various technology resources that are available enhances the learners’ motivation for integrating technology. Self-efficacy is enhanced when trainings include how technology can be integrated into learning and instruction (Worch et al., 2012). Based upon pre-service technology integration research (Worch et al., 2012), higher education institutions may impact pre-service teacher’s self-efficacy and outcomes in a positive manner through providing

relevant technology integration courses within a specific content area of study. These results are consistent with previous research (Abbitt, 2011) on pre-service technology integration training.

Pedagogical model integration. Abbitt (2011) studied the conceptual framework called Technological Pedagogical Content Knowledge (TPACK) and its relationship with self-efficacy. The study found that the TPACK model has a strong relationship in predicting teacher self-efficacy with technology integration. Beriswill et al. (2016) found that implementing technology training to meet CCSS incorporating the TPACK model had a positive impact on teacher pedagogy in integrating technology. The study introduced multifaceted professional development through introduction of the CCSS, collaboration, content, and integrating of various Web 2.0 technology resources (Beriswill et al., 2016). Beriswill et al. (2016) notes that teachers were introduced to technology that worked specifically with the content and included reflections at the end of each session that were helpful. In addition, the TPACK was used as an instrument of measuring teachers pedagogical and content knowledge which resulted in the initiative having a positive effect. However, McLeod criticize the TPACK and the SAMR model in that it lacks resources in helping teachers recognize areas of improvement. These are important findings that pre-service and in-service institutions should consider when designing courses and professional development for teacher in-service training programs.

Summary

The review of the literature reveals that schools are receiving federal grant money to spend on resources such as technology and infrastructure (FCC, 2016). Teacher training and continued support of the use of technology have an effect on teacher attitudes towards technology in general. In order for teachers to accept technology and be willing to integrate it into the curriculum, schools need to provide quality on-going professional development

(Beriswill et al., 2016; Overbaugh et al., 2016). Technology use and integration in the classroom depends on professional development that is long-term. Little is known in the K-12 educational environment of teacher perceptions and attitudes of their lived experience in working with GSFE and using Chromebooks. There is a gap in the literature on K-12 public school teacher experiences using GSFE and Chromebooks in the classroom. Furthermore, few existent studies have used a qualitative phenomenological approach to understand the essence of the shared experiences of teachers who use GSFE and Chromebooks in the classroom. Although there are studies on the use of laptops and iPads, the devices and learner experiences differ significantly from the Chromebook and the integration of GSFE. For example, G Suite for Education with Chromebooks offers online collaboration, immediate feedback, and sharing of documents which creates a teaching and learning environment that requires specific pedagogical needs. Teachers need technology integration skills in order to integrate the collaborative experience and tools into the classroom. Prevalent themes derived from the literature include the impact cloud computing has on implementing Common Core State Standards, the role tech support and infrastructure has on teacher perceptions, the need for long-term meaningful professional development, and the role of self-efficacy in teacher perceptions of integrating technology into the curriculum.

CHAPTER THREE: METHODS

Overview

The purpose of this phenomenological study was to examine the lived experiences of public school teachers using Google Suite for Education with Chromebooks to integrate technology into the core curriculum. This chapter begins with an overview of the selected design and identifies a gap in the literature. The setting is then introduced and the participants are described. This chapter also provides an overview of the procedures, including the selection of participants through purposeful sampling, my role as the researcher, data collection, and data analysis. The chapter concludes with the procedures that were used to achieve trustworthiness, a brief discussion of ethical considerations, and a brief summary.

Design

This was a qualitative study using a transcendental phenomenological approach to understand the lived experiences of public school teachers using GSFE with Chromebooks integrated into the core curriculum. According to Creswell, researchers use qualitative research when a problem needs to be explored (2013, p. 47). In addition, Creswell (2013) notes that a phenomenological design works well when the researcher is interested in discovering the meaning of shared experiences. Moustakas (1994) notes that a transcendental-phenomenological approach allows the researcher to step back from preconceived ideas or presuppositions. To limit researcher bias in understanding the lived experiences and to view the data from a fresh perspective, bracketing was used. Bracketing involves the researcher making notes of any bias, preconceptions, or presupposition in order to put them aside (Creswell, 2013). Furthermore, the transcendental phenomenological approach allowed me to focus on the teacher beliefs and perceptions of integrating GSFE in the core classroom from a fresh perspective and to remove

researcher involvement.

Given (2008) defines perception as the following:

Perception is a mode of apprehending reality and experience through the senses, thus enabling discernment of figure, form, language, behavior, and action. Individual perception influences opinion, judgment, understanding of a situation or person, meaning of an experience, and how one responds to a situation. (p. 607)

Furthermore, Moustakas (1994) notes experience as, “The understanding of meaningful concrete relations implicit in the original description of experience in the context of a particular situation is the primary target of phenomenological knowledge” (p. 14). Lastly, this qualitative study using a transcendental approach produced textural and structural descriptions which when combined resulted in discovering the essence of the phenomenon of the lived experiences of teachers’ use of GSFE with Chromebooks.

Research Questions

Central Question: How do grade 4-8 public school core content teachers perceive the experience of using G Suite for Education with Chromebooks in the classroom?

Sub-question 1: How do grade 4-8 public school core content teachers perceive the impact of integrating G Suite for Education on teaching pedagogy?

Sub-question 2: How do grade 4-8 public school core content teachers perceive the impact of using Chromebooks in the classroom on student learning?

Sub-question 3: How do grade 4-8 public school core content teachers describe technology support and training integrating G Suite for Education?

Setting

The setting for this study was Magnolia Schools which is a school district that serves two

rural communities in the northeastern United States. This setting was chosen for the study because the school district has adopted GSFE in grades 4-12 with faculty and students (with parent permission) having Google accounts. In addition to GSFE being used by many teachers with their students, Magnolia has also purchased multiple Chromebook carts where teachers are using them in their classrooms and where each student uses a Chromebook as part of their course work. Magnolia Schools has three elementary schools, one intermediate school, two middle schools, and a regional high school that service students residing in two different towns. The school district serves an approximate total PreK-12 student population of 5,288. The leadership of the school district includes a school committee, superintendent of schools, assistant superintendent of schools, school business manager, special education administrator, human resources manager, principals, and assistant principals. The technology department consists of an information technology manager, a school database manager, and three computer technicians. The ethnic makeup of the student population is White 88.8%, multi-race non-Hispanic 3.9%. African American 3.7%, Hispanic 2.5%, Asian 1.5%, Native Hawaiian, and Pacific Islander 0.1%. The school district has 334 teachers with 100% licensed by their teaching state in their teaching area. The state department of education in which Magnolia Schools is located, has ratings for school accountability levels. The rating scale consists of accountability levels of one through five, with one being the highest and five being the lowest. Magnolia's school accountability level in 2015 was a level two; recently released 2016 accountability data reported a change to a level three school district.

The setting for the study was also selected due to their technology advancements in using GSFE in the classroom with Chromebooks. The district's total expenditure on instructional materials, equipment and technology was \$1,370,804 in 2014. Each school has multiple

computer labs with an infrastructure of wired and wireless technology. The middle school and high school have multiple Chromebook carts with 30 Chromebooks in each cart that teachers reserve to use in their classrooms. In addition, each school has at least one iPad cart of 30 for teachers to reserve and use in their classrooms. GSFE implemented at the high school in 2013 and then was adopted in 2014 in grades 6-8; grades four and five began using GSFE in 2015. Chromebooks were first introduced to the high school staff in the fall of 2014 with professional development training. In spring 2015 one middle school received Chromebook carts for teachers to reserve. In 2016, an intermediate school that serves grades 4-6 received four Chromebook carts and a middle school received additional carts for each team. In the Fall of 2016, another middle school in the district received two Chromebook carts with a quantity of 30 in each and all school administrators in the district received a Chromebook. As of August 2016, the school district had a total of 4,415 GSFE accounts and 671 Chromebooks. Professional development at the site is three full days set at various times of the school year; however, training typically occurs before students return from summer break. Professional development offerings have included training in beginner to intermediate using GSFE. Although GSFE professional development has not been a mandatory training, teachers select from various workshop offerings and attend the workshops they are interested in on the three designated professional development days.

Participants

The participants in this study included 13 English Language Arts (ELA), Math, Science, and Social Studies public school teachers that instructed students in grades 4-8. The participants had taught a core content instructional area using GSFE with Chromebooks. The grades 4-8 levels and content areas best represent the overall distribution of teachers district-wide who used

GSFE with Chromebooks. In comparison, 51% of public school teachers nationwide instruct at the elementary school level and 49% secondary level with the highest instructing core content subjects (NCES, n.d.). Purposeful sampling had been used to identify participants that have experienced the phenomenon of using GSFE with Chromebooks (Moustakas, 1994, p. 107). According to Gall, Gall, and Borg, purposeful sampling is "...the process of selecting cases that are likely to be "information-rich" with respect to the purposes of a particular study" (2005, p. 554). Purposeful sampling was needed in order to study participants that have experienced the phenomenon and to include rich descriptions for this phenomenological research.

Table 1

Demographics

Participant	Age	Years Teaching	Gender	Race
Aiden	32	10	Male	White
Amanda	30	6	Female	White
Ann	55	30	Female	White
Beth	49	27	Female	White
Catherine	52	25	Female	White
Cynthia	52	23	Female	White
Deb	44	10	Female	White
Jan	52	22	Female	White
Karen	44	25	Female	White
Kim	56	21	Female	White
Pam	45	16	Female	White
Ruth	59	28	Female	White
Sue	58	23	Female	White

Procedures

Once approval for the study had been granted by the IRB, I contacted the district's superintendent of schools with an email describing the study and requested permission to conduct the study within the school district. Once site approval had been obtained, grade 4-8 teachers were emailed information about the study with the informed consent (Appendix E) form which included consent for audio recording individual focus group interviews for later transcription as well as a link to complete a questionnaire and consent. I met individually with each interested participant and explained the study and answered questions if needed. Participants were entered into a drawing to win one of five 20-dollar gift cards to Amazon.com.

The emailed invitation included a link to the questionnaire (Appendix A) and informed consent; the questionnaire requested the grade they instructed, subject instructed, years of service, and validation of using G Suite for Education with Chromebooks for one semester or more during the 2016-2017 school year or previous school years 2015-2016 or earlier. Using criterion sampling, I then contacted teachers that were core content teachers with three years' teaching experience and one term or more experience using G Suite for Education with Chromebooks to set up individual interviews.

Three different types of data were collected, including individual interviews, focus groups, and participant journals. All interviews were audio recorded, transcribed, and member checked for accuracy. Data were analyzed through coding and searching for significant statements and resulting themes which helped identify the essence of the shared experience for the study participants. Trustworthiness included triangulation of multiple sources, member-checking of transcripts, bracketing, and rich thick descriptions. Ethical considerations were aligned with the IRB policies and procedures with materials properly stored and secured. In

addition, site and participant names were replaced with pseudonyms for confidentiality.

The Researcher's Role

I have 10 years' experience as a certified K-12 instructional technology teacher; three of those years included working as a technology integration specialist. I am employed by the research site as a computer teacher. My professional experience with GSFE and Chromebooks includes teaching students and teachers how to use GSFE and using the Chromebooks to complete a lesson or project that is integrated into a specific subject. I also have experience setting up the bulk amount of GSFE student and teacher accounts at the site as well as assisting with resetting accounts. Personally, I have been using a computer for over 35 years.

My professional and personal background in technology has created an interest in understanding the phenomenon about teacher attitudes and perception of integrating technology in the classroom, specifically using G Suite for Education. The presuppositions that I bring to this research include the belief that long-term professional development over the course of a school year produces positive teacher attitudes and the desire to use technology in the classroom. I also believe that GSFE with Chromebooks motivates students and creates engaged learners. Finally, I believe that networking and wireless connectivity issues affect teacher motivation to use technology in their classrooms. I used bracketing to describe personal experiences in order to view all data from a new and fresh perspective. This is consistent with Creswell, who states that "In some forms of phenomenology the researcher brackets himself or herself out of the study by discussing personal experiences with the phenomenon" (2013, p. 78).

Data Collection

The data for the study were collected through individual interviews, focus groups, and journals. Individual interviews were the first step during data collection because Creswell notes

that in-depth individual interviews are the primary source of data in phenomenological studies (2013, p. 161). According to Creswell, “The important point is to describe the meaning of the phenomenon for a small number of individuals who have experienced it” (p. 161). For this reason, individual interviews provided understanding of participants’ shared experiences of the phenomenon. According to Bogdan and Biklen, in-depth interviews allow the researcher to interact with their subjects in creating an environment where the participant responds naturally in a familiar and comfortable setting (2007, p. 39). The second step and approach to data collection included focus groups. Conducting focus groups allowed me to gain further insights of shared experiences that produced new themes from that of the individual interviews (Gall, Gall, & Borg, 2005). According to Gall et al. (2005) “Focus groups sometimes are used by researchers to explore such phenomena as individuals’ reactions to educational programs and practices” (p.313). In order to develop further insights on teaching practices in integrating technology, focus groups were necessary for conducting this study. As noted by Creswell, multiple interviews with the same individuals are part of phenomenological research (p. 149). The last step and approach to data collection included participant journals. The collection of participant journals allowed participants to reflect about their experiences using GSFE which revealed rich descriptions of their experience. According to Gall et al. (2005) diaries “written under the immediate influence of an experience, it can be particularly effective in capturing peoples’ moods and most intimate thoughts” (p. 134). Creswell notes that journals are additional forms of data in phenomenological research (2013, p. 81).

Individual Interviews

Individual interviews were conducted using semi-structured open-ended questions. Individual interviews allowed participants to discuss their experience with the phenomenon

(Creswell, 2013; Moustakas, 1994). The interview questions were constructed to understand the perceptions of the experience the participants have in working with GSFE and Chromebooks. Individual interviews took place before, during, or after school at an agreed upon time in the teacher's classroom or available classroom. The classroom setting were used for the interviews in order for the participant to feel comfortable and relaxed in a familiar space in order to share and express their experience as discussed by Creswell (2013). Participants were given the opportunity to ask any questions about the research prior to the individual interview. The interviews took no longer than one hour. The participants were able to comment in the margin of the transcript if any revisions were needed.

Individual Standardized Open-Ended Interview Questions

1. What has your experience been using GSFE with Chromebooks in the classroom?
2. What factors have impacted your use in integrating G Suite for Education with Chromebooks in the classroom?
3. Please describe your first impression about G Suite for Education with Chromebooks when it was first introduced to the district.
4. Please describe how you felt about G Suite for Education with Chromebooks after integrating into your curriculum for the first time.
5. How long have you been using GSFE with Chromebooks in your classroom?
 - a. How do you feel now about G Suite for Education with Chromebooks after using it over time?
 - b. What attitudes or personal perceptions have changed since you have used it over time?
6. What applications in G Suite for Education do you use with your students?

7. How has G Suite for Education impacted your teaching?
8. How did you change your delivery of the content when integrating G Suite for Education?
9. How did you change your student assessment of the content when integrating G Suite for Education?
10. Please describe the type of learning activities students participated in using G Suite for Education.
11. Have you found any changes in student learning using G Suite for Education?
12. Please describe how G Suite for Education with Chromebooks works with your subject frameworks and Common Core standards.
13. How do you perceive the use of Chromebooks in your classroom?
14. Please describe how students used the Chromebooks in your classroom.
15. Please describe how students perceive the use of Chromebooks in your classroom.
16. Please describe any professional development you have received using GSFE and Chromebooks.
17. How do you perceive professional development and support for using GSFE with Chromebooks?
18. What technical issues have you encountered when using Chromebooks?
19. What would you suggest to school systems looking to implement GSFE with Chromebooks?
20. What suggestions do you have for a colleague interested in integrating GSFE with Chromebooks?

Questions 1-2 were phrased based upon Creswell's (2013) approach to conducting phenomenological research. Creswell indicates the use of two main open-ended questions as identified by (Moustakas, 1994) for identifying the participants' shared experiences which include "textual and structural descriptions" (2013, p. 81). The two questions were constructed in order to identify the teacher perceptions of using GSFE with Chromebooks in the classroom. In addition, questions 3-5 were developed to further understand the "what" and "how" the participants have experienced using GSFE with Chromebooks in the classroom (Creswell, 2013).

Questions 6-11 were developed to understand teacher perceptions of technology, attitudes, and beliefs. These questions were important to allow for rich descriptions of the phenomenon being studied in order to develop an understanding of the participants' view of their world from their own voice (Bogdan & Biklen, 2007). These questions were phrased to further develop understanding of teacher belief of the value of integrating technology. Ottenbreit-Leftwich, Glazewski, Newby, and Ertmer (2010) have found that teachers are willing to use technology in the classroom when they find it adds value to student learning. These questions expanded upon the participants' worldview of technology and allowed for deeper understanding of the phenomenon of the use of GSFE with Chromebooks.

Questions 12-16 allowed teachers an opportunity to discuss their experience with the Chromebooks in the classroom. In adding to the research of Sahin, et al. (2016) these questions gave further insight into the use of Chromebooks as perceived by the teacher by allowing them to voice their experiences using the technology in a learning environment. The questions shed light on the teacher experience in which they shared specific experiences they encountered while teaching with GSFE and Chromebooks.

Questions 17-18 (Beriswill et al, 2016, Kopcha, 2012; Sahin et al., 2016) identified professional development and technical issues as areas to be defined as barriers to instructing with technology. Questions 17-18 were purposely placed toward the end of the interview because by this point in the interview the participants felt more comfortable with the me, having built a rapport (Patton, 2015), which allowed the participants to be less guarded in answering the question. Questions 19-20 were the closing questions that allowed the participants to summarize their experiences using GSFE by responding to questions eliciting their opinion on how GSFE with Chromebooks should be adopted by giving them the opportunity to speak as an expert on the subject matter (Patton, 2015).

Focus Groups

Focus group interviews were guided using semi-structured open-ended questions (Appendix C) to gain rich descriptions of the phenomenon (Moustakas, 1994). The focus group interviews addressed the central research question and sub questions. Focus groups allowed participants to have dialogue about their shared experience with the phenomenon (Bogdan & Biklen, 2007). Using semi-structured open-ended questions assisted in keeping the participants from going off topic (Bogdan & Biklen, 2007). In order to fill the gap in research and further develop an understanding of teacher use of GSFE and Chromebooks, the focus group questions were constructed to understand the perceptions of the experience the participants had in working with GSFE and Chromebooks. According to Bogdan and Biklen (2007) focus groups can range from seven to ten participants (p. 109). The proposed size of the focus group was 12 to 15. Due to the sample size, two focus groups were organized to limit the groups to no more than 10 participants. Both focus group interviews took place in a classroom at one of the schools. The meeting space was free from distractions for participants to feel relaxed and a space that had

allowed for audio recording (Creswell, 2013). Each focus group took place after school at an agreed upon date and time. Both focus group interviews took no longer than one hour. After each focus group interview had taken place, the recordings were transcribed. Preliminary themes derived from the focus group interviews were shared with the groups for reflection as defined by Creswell's (2013) approach to member checking after conducting a focus group (p. 252). The preliminary analysis was shared with the focus group electronically through email for participants to reflect on accuracy and to provide comments.

Focus Group Standardized Open-Ended Questions

1. Please describe the training you received for using G Suite for Education.
2. Please describe the training you have received prior to using Chromebooks in your classroom.
3. Please describe any roadblocks that you experienced while integrating G Suite for Education with Chromebooks in your classroom.
4. How did you overcome these roadblocks?
5. What perceptions do you have on GSFE with Chromebooks on student learning?
6. Please describe any professional development or support available to you?
7. How do you feel about the current professional development activities available to you?
8. What do you suggest to other schools implementing G Suite for Education with Chromebooks in regard to technical support and professional development?
9. What advice would you give to administration for school systems looking to implement G Suite for Education with Chromebooks?

Questions 1-8 were created to further understand the shared experiences of using GSFE with Chromebooks in the classroom from perceptions, pedagogy, and support. These questions were

created to promote discussion on the issues in integrating technology. Dooley et al. (2016) found that teachers have difficulty with formatively assessing technology projects. The questions were developed to allow the group to further discuss their view (Bogdan & Biklen, 2007). Questions 8-9 gave the group the opportunity to provide reflection and advice to others that may share the experience.

Journals

Creswell notes another valuable type of data in a phenomenological study are journals (2013, p. 81). Including journals in this study also provided another layer of triangulation with all data collected (Creswell, 2013). Teachers were asked to create a Google Doc that would be used as a digital journal shared with the researcher. Participants were asked to use the journal prompt (Appendix D) as a reflection tool with dated entries each time they integrated GSFE with Chromebooks over the course of three weeks. The journals were analyzed for themes which were then cross referenced with all participants' journals for generalized themes and statements. Using journals allowed for an in-depth analysis of shared experiences and meaning along with providing triangulation with rich descriptions.

Data Analysis

The data for this transcendental phenomenological study were analyzed using bracketing (epoche) and analysis of data following Moustakas (1994) modified Stevick-Colaizzi-Keen method as simplified by Creswell (2013). Prior to data analysis, individual interviews were recorded and transcribed. The transcripts of the individual interviews were shared with individual participants to check for accuracy. Once accuracy was determined, data were ready for analysis. Focus group interviews were recorded, transcribed, and analyzed through significant

statements and themes. The preliminary themes were shared with the focus group for reflection; once accuracy had been determined, the preliminary themes were then ready for analysis.

In order to avoid reporting my own experience and presuppositions with the phenomenon, the method of epoche as defined by Moustakas (1994) was utilized. According to Creswell (2013) the process of bracketing involves the researcher setting aside personal experience and viewing the phenomenon with a fresh lens. Therefore, prior to conducting interviews with participants, I documented my feelings and ideas based upon past experiences working with GSFE and Chromebooks in order to conduct the interview from a new and fresh perspective. Furthermore, prior to conducting analysis of individual and focus group interview transcripts and reflective journals, I bracketed any experiences, thoughts, and feelings I had about the study in order to view the information from a new perspective.

Analysis of individual interviews, focus group data, and individual journals followed Creswell's 'simplified version' of Moustakas' Stevick-Colaizzi-Keen method (2013, p. 193). The first stage in conducting the analysis included reading each individual interview transcript, focus group transcripts, and journal entries multiple times in order to become immersed in the data. Each line of the transcripts and journals were read in order to identify significant statements that were directly related to the experience in using GSFE and Chromebooks (Creswell, 2013). In a separate document a table was created that included the significant statements which were labeled with a transcript identification number from the originating transcript. The second stage in analysis included a table that included the identified significant statements with researcher formulated meanings derived from the significant statement that were listed next to each significant statement in a table. The third stage in the analysis process organized the formulated

meanings into themes. According to Creswell this stage of analysis will uncover shared themes from all transcripts (2013).

Once the themes were identified, textual descriptions described what teachers experienced with GSFE with Chromebooks (Creswell, p. 193). The structural descriptions described how teachers experienced the phenomenon integrating GSFE with Chromebooks (p. 194). The final descriptions revealed the “essence” of the phenomenon of integrating G Suite for Education with Chromebooks.

Trustworthiness

The following validation strategies were used in this study to address credibility, dependability, confirmability, and transferability of the study (Creswell & Miller 2000; Lincoln & Guba, 1985; Shenton, 2004).

Credibility

Member checking is the process in which the researcher involves the participants to review the transcripts and or preliminary themes and give feedback to the accuracy of the analysis which incorporates participant feedback in the research (Creswell & Miller, 2000). The process of member checking was used to validate both individual interviews and focus group preliminary themes. The transcribed interviews were shared with each participant to review for accuracy. Focus group preliminary themes were shared with the participants for reflection on the accuracy.

Another strategy for ensuring credibility in research included triangulation which is the process of including multiple data sources to validate accuracy (Creswell, 2013). The study included three various sources such as individual interview, focus group interview, and

participant journals to validate shared themes. In using three different data sources it creates validity of the research results (Creswell, 2013).

Dependability and Confirmability

Bracketing includes a description of any researcher bias, presupposition, and experiences (Creswell, 2013). A bracketing summary is included in the research in chapter three under researcher's role. The paragraph includes personal experience with the phenomenon and assumptions. In discussing my presuppositions and assumption and integrating triangulation it builds upon the research dependability and confirmability. In keeping a bracketing journal, bracketing will occur prior to interviewing participants. Bracketing is also known as epoche, "setting aside prejudgments and opening the research interview with an unbiased, receptive presence" (Moustakas, 1994, p. 180). In addition, bracketing was completed prior to data analysis of interview data and participant reflection journals.

Transferability

Creswell and Miller (2000) define rich description as describing the site, participants, and the phenomenon with thick descriptions in a way that the reader can imagine themselves in the context as if they were there. This study included thick descriptions in describing and reporting the data. Incorporating rich descriptions in the study was used to enhance transferability to others looking to reproduce the study with a similar site or participants (Guba, 1981).

Ethical Considerations

Ethical considerations used in the study included receiving approval by the university's Institutional Review Board (IRB) and receiving site approval. All participants completed informed consent to participate in the study with the option for audio recording consent. The site and participant names were replaced with pseudonyms to ensure confidentiality. All data were

backed up on a flash drive and written accounts with field notes were stored in a locked cabinet. The use of member checks, triangulation, epoche, and rich description increased validity in recording the participants' beliefs and the themes revealed. All participants were reminded they could withdraw from the study at any time and that their participation in the study would not impact their employment in the district.

Summary

Chapter three described the qualitative research methods that were used in this transcendental phenomenological study to examine the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the core curriculum. The central research question sought to discover how grade 4-8 public school core content teachers perceive the experience of using G Suite for Education with Chromebooks in the classroom. Additional sub questions were developed to further inquiry on specific areas (Creswell, 2013). The research took place in a public-school district that had been using G Suite for Education and Chromebooks for over three years. Participants in the study were purposefully selected due to their experience working with GSFE and Chromebooks. My role as the researcher was identified to allow for further understanding of my personal experiences with the phenomenon and identify my presuppositions. Upon Institutional Review Board (IRB) and site approval, three types of data were collected: semi-structured open-ended individual interviews, standardized open-ended focus group interviews, and participant journals. During collection of the data, epoche was conducted in order for all interactions and analysis to be viewed from a fresh perspective. All data collected were analyzed using Creswell's (2013) simplified version of Moustakas' (1994) modified Stevick-Colaizzi-Keen analysis. In order to ensure trustworthiness, member checking, triangulation, bracketing, and thick descriptions were incorporated into the

study. In addition, ethical considerations were discussed, including the ensuring of compliance with IRB policies, site, and participant anonymity through the use of pseudonyms, and security protocols to ensure backup and safe keeping of all research documentation. This study sought to fill a gap in the research on GSFE with Chromebooks and will assist educational institutions in understanding the lived experiences of educators. The findings of this study may provide schools and teachers valuable discoveries regarding best practices and procedures for implementing and integrating Google's Suite for Education with Chromebooks in classrooms.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this phenomenological study was to examine the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the core curriculum. The participants of the study were 13 teachers from a school district in northeastern, United States. The four major themes that resulted from the transcendental phenomenological data analysis included teacher attitude and instructional practice, Chromebook accessibility and connectivity, student learning, and inconsistent training and support. In this chapter the participants are described, the results are presented, the themes are explored, and the central and sub-questions are discussed. The chapter concludes with a succinct summary of the results of the research.

Participants

Participants were purposefully selected, but they volunteered after receiving emailed invitations to participate in the study. To participate in the study, participants had to be a core content teacher with three years teaching experience and a minimum of one term use of GSFE with Chromebooks. Participants that were interested in the study completed an online criteria questionnaire and an informed consent form. Fourteen participants completed the informed consent form; however, one person did not include their contact information, resulting in 13 participants. No participants withdrew from the study and all 13 participants participated in the individual interviews; however, 11 participated in the focus groups, and nine completed the journal entries. Once teachers completed the criteria questionnaire and the informed consent forms, they were contacted for an individual interview. Interviews took place either before

school, during a teacher planning period, or after school. Two focus groups were conducted after school to accommodate participant availability.

The participants included Grade 4-8 teachers representing all core content areas. Three participants were Grade 4 teachers instructing all core content subjects, two were Grade 5 teachers that instructed Science and English Language Arts (ELA), and two were Grade 6 teachers who instructed ELA. In addition, the Grade 7 participants were teachers who instructed ELA, Math, Science, or Social Studies, and the two Grade 8 teachers were instructors of either Science or Social Studies. All participants in the study were tenured teachers working for the Magnolia School District. The average years of overall teaching experience for the 13 participants was 20 years and the average with the Magnolia School District 17 years. The majority of the participants (11 of 13) were involved in extracurricular activities beyond the school day. Table 2 below provides teaching experience, content area, and Google usage experience. (All participant names have been replaced with pseudonyms to ensure anonymity.)

Table 2

Participant Teaching Information

Participants	Years Teaching	Subject	Academic Years Using GSFE with Chromebooks
Aiden	10	ELA	2
Amanda	6	Science	1
Ann	30	Math, Science, ELA, Social Studies	2
Beth	27	ELA	2
Catherine	25	Math, Science, ELA, Social Studies	2
Cynthia	23	ELA	2
Deb	10	Social Studies	2
Jan	22	Science	2
Karen	25	Math, Science, ELA, Social Studies	1
Kim	21	Social Studies	1
Pam	16	Math, Science, ELA, Social Studies	2
Ruth	28	ELA	2
Sue	23	ELA	2
Mean Years	20.46		1.7

Pam

Pam was a Grade 4 core content teacher with 15 years of experience and had been with Magnolia School District for 13 years. Pam integrated technology into her curriculum quite frequently. Prior to teaching, Pam worked in the public sector. Pam decided to become a teacher

after volunteering at a school. Pam headed a couple of student activities in addition to district extracurricular activities. In Pam's free time she enjoyed reading, art, and adventures outdoor as well as kayaking. The technology she used at home included a smartphone, iPad, and MacBook. Pam had been using Google Suite for Education with the Chromebooks for two years.

Karen

Karen was a Grade 4 core content teacher with 25 years of service with the Magnolia School District. Karen had been working as a Grade 4 teacher for 13 years and had been a teacher for the entire 25 years. Karen was an energetic teacher who focused her time beyond the school day by performing extracurricular activities. Karen's decision to become a teacher was influenced by her mother who was also a teacher. Her hobbies included reading, exercise, relaxing with a good book or a movie, and watching her son's hockey and lacrosse games. Karen owned a cell phone, desktop, and an iPad. Karen had been using Google Suite for Education with the Chromebooks over one academic school year.

Ann

Ann was a Grade 4 core content teacher with 30 years of experience. Twelve of those years was spent working in a different content area. Ann decided as a child that she wanted to be a teacher. Ann's classroom exuded fun and creativity with student projects displayed prominently. Her classroom was an inviting place. Ann was not involved in any after school activities. Ann enjoyed music, crafts, reading, and traveling. The technology she used and owned included a Samsung Galaxy smartphone, MacBook Pro, and an iPad. Ann had been using Googles Suite for Education with Chromebooks for two years.

Jan

Jan was a Grade 5 Science teacher whose classroom and responses showed her enthusiasm as a teacher. Jan had worked for 23 years for Magnolia School District. Prior to being a teacher, she had worked in the business sector. Jan became a teacher because she liked working with kids and wanted a job where she could use her intellect. She was very involved at school and also served on a committee. When not teaching she enjoyed being with her family and kayaking. Jan owned a cell phone, laptop, and a Smart TV. Jan had been using Google Suite for Education with the Chromebooks for two years.

Cynthia

Cynthia was a Grade 5 ELA teacher with 23 years of teaching experience. Cynthia had been a teacher in another district for four years prior to working at Magnolia. She decided to become a teacher because of a previous teacher she had as a child. Cynthia also exhibited commitment by serving in an extracurricular activity for the school district. Cynthia enjoyed spending her outside time with family, working with hobbies, or relaxing with boating or gardening. For home technology, she owned a cell phone, tablet, and a laptop. Cynthia had used Google Suite for Education with the Chromebooks for two years.

Ruth

Ruth was a veteran teacher with 28 years of experience teaching Grade 6 ELA. Twenty-five of those years were dedicated to Magnolia School District. Ruth had eloquent interview responses characterized by thoughtful pauses before answering each interview question. Ruth was a very innovative ELA teacher who integrated technology regularly. Ruth became a teacher because both her mother and sister were ELA teachers. Ruth's dedication to students continued beyond the school day through involvement in student activities. Ruth had a love for skiing,

theatre, reading and writing. She owned a smartphone, iPad, and a laptop. For the past two years Ruth has been using Google Suite for Education with the Chromebooks.

Beth

Beth was an energetic and enthusiastic Grade 6 ELA teacher who also had experience as a social studies teacher. She was with Magnolia School District for 25 years in addition to two years prior teaching experience. Beth integrated technology into the classroom regularly. She became a teacher because of her love of children and literature. She was also involved in an extracurricular activity for the district. Beth liked reading, art, exercise, and the beach. In addition, Beth owned a cell phone and a desktop computer and had been using Google Suite for Education with the Chromebooks for three school years.

Aiden

Aiden was a Grade 7 ELA teacher and the only male participant in the study. He was an enthusiastic teacher with 10 years teaching experience. Aiden's classroom had a variety of posters and organizational containers. The setup of his classroom showed that he was a very well-organized teacher with specific procedures for students to follow. Aiden was a frequent user of Google Classroom and showed colleagues how to use it. Aiden wanted to become a teacher because he enjoyed working with adolescents and personally enjoyed sharing his love for great works of literature. Aiden's dedication to teaching and the school district was exhibited in his involvement in multiple after school student activities. For hobbies Aiden was finishing a second graduate degree. The technology Aiden owned included a cell phone, iPad, and a MacBook. Aiden had used Google Suite for Education with Chromebooks for two years.

Sue

Sue was a Grade 7 Math teacher with 23 years of teaching experience including the past 14 years in the Magnolia School District. Although Sue had prior work experience in the private sector, it was her life-long ambition to be a teacher. Her classroom was full of helpful instructional posters and student technology-produced work displayed on her classroom bulletin board. The student work posted exhibited Sue's creative teaching incorporating project-based learning with technology. The back of the room included a Chromebook cart. Sue used Google Classroom to post a variety of tools and resources for her students. She was a dedicated Math teacher evidenced by all the resources that she made available to her students using Google Classroom. In addition, Sue dedicated her time beyond the school day with her involvement in leading several after school student activities. Sue owned a cell phone, laptop, and an iPad. Sue had used Google Suite for Education with the Chromebooks for two years.

Deb

Deb was a Grade 7 Social Studies teacher with 10 years teaching experience, including six years in the Magnolia School District. Deb had a variety of experience teaching various subjects as well as private sector experience prior to teaching. Deb used Google Classroom to post multiple resources for her students in addition to links to a variety of websites. Deb decided to become a teacher because she always wanted to teach, loved social studies, and wanted to share that passion. When not teaching Deb followed current events and politics, read books, and watched her children at sporting events. Deb owned a cell phone, iPad, Chromebook, and laptop. Deb had been using Google Apps for Education with Chromebooks for two years.

Catherine

Catherine was a Grade 7 Science teacher with 25 years teaching experience with 15 of those years in the Magnolia School District. Catherine's classroom setup encouraged collaboration by students. Science materials could be found around the room creating an atmosphere of experiential learning. Catherine used Google Classroom for her students to access online resources that enhanced her lessons by providing online science simulations.

Kim

Kim was a grade 8 Social Studies teacher who had been with Magnolia School District for 19 years. Kim was very committed to teaching and her students for she led multiple student activities and served in various capacities in extracurricular activities for the school district. Kim was eager to share her experience using Google Suite for Education. When she was not teaching she enjoyed reading, shopping, and exercising. Kim owned a cell phone, Microsoft Surface, and a Smart TV. Kim had been using Google Suite for Education with Chromebooks for one school year.

Amanda

Amanda was the youngest teacher of the participants with six years teaching experience in the Magnolia School District as a Grade 8 Science teacher. Amanda became a science teacher because she wanted to have a positive impact on the lives of young adults and wanted to spend her day discussing science. Amanda was a highly involved teacher for she served on multiple committees and also headed a student activity. Amanda enjoyed gardening, reading, biking, and running. When not teaching Amanda enjoyed spending her time with her family and pet. She owned a cell phone, laptop, and an iPad. Amanda used Google Suite for Education last year with her students and had recently begun using Chromebooks.

Results

The following central research question guided the study: How do grade 4-8 public school core content teachers perceive the experience of using G Suite for Education with Chromebooks in the classroom? The following sub questions were developed to further the study: How do grade 4-8 public school core content teachers perceive the impact of integrating G Suite for Education on teaching pedagogy? How do grade 4-8 public school core content teachers perceive the impact of using Chromebooks in the classroom on student learning? And How do grade 4-8 public school core content teachers describe technology support and training integrating G Suite for Education? The open-ended individual interview questions and focus group interview questions were developed to elicit responses that would answer the central question and sub-questions of the study. Using a transcendental phenomenological approach to data analysis the following four major themes were discovered: Teacher Attitudes and Instructional Practice, Chromebook Accessibility and Connectivity, Student Learning, and Inconsistent Training and Support.

Theme 1: Teacher Attitudes and Instructional Practice

Theme one revealed the shared experiences of teachers using Google Suite for Education with the Chromebooks. This theme identified the teacher perception of the experience of using Google Apps for Education and revealed their attitude toward and instructional practices with both GSFE and the Chromebooks. The theme was based upon the significant statements that each participant expressed in their interviews and journal entries.

Most participants believed that GSFE was a positive experience for them and their students. For example, Ruth expressed that GSFE was “Very successful, very convenient” (personal communication, May 17, 2017). Sue, Beth, and Kim shared similar thoughts about

being positive or that their positive attitude increased over time. For instance, Aiden described his experience as, “I think it’s fantastic! I think its been fantastic. I mean it really has changed the way I can teach and you know the amount of things I can actually do” (personal communication, May 23, 2017). Deb found her experience to be the same for she said, “I would say overall my experience is very positive” (personal communication, May 18, 2017). Catherine expressed her positive experience by stating, “I love it, I still love it, it does everything we needed to do easily” (personal communication, May 25, 2017). In general, teachers expressed that instructing students using collaboration was an important tool that could be used to provide feedback to students or to encourage students to work together collaboratively. Amanda underscored this when she said,

I liked using the Chromebooks because they can be in the classroom working in groups at tables and rather than being in a lab like in rows or um or you know a horseshoe around the room they can be like all together and they can be working as a group and they can be working on the same file at the same time. Which I thought was just so cool. (personal communication, May 25, 2017)

Ruth shared how Chromebooks enhance student learning stating, “It makes learning fun and accessible to be able to use Chromebooks, plain and simple, it opens a whole new world” (personal Communication, May 17, 2017).

Theme 1 showed that participants sometimes started off unsure of themselves but then over time become more positive. However, they continued to have a positive attitude once they started using the technology. In addition, teachers discovered how using GSFE enhanced their teaching practice through collaborative work and student-centered learning. Collaboration and student-centered learning was further supported by Deb who said, “So it’s more student centered than me presenting” (personal communication, May 18, 2017). In addition, discussion about

GSFE with Chromebooks with integration of Common Core were shared Deb stated, “It’s very conducive to Common Core because Common Core is so collaborative. I think that makes it much easier for Common Core” (personal communication, May 18, 2017).

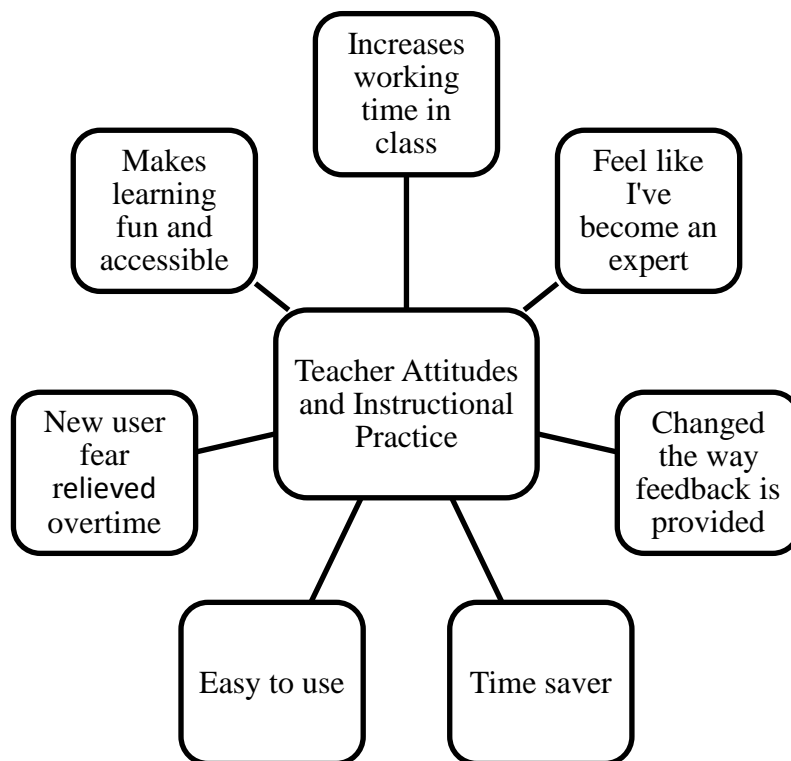
The recognition of student use of technology and the need to integrate technology into the classroom to meet CCSS was also found. For example, Sue said:

Most of the kids are quite tech savvy and we feel that we should utilize the technology that they are used to and also to get them prepared for the 21st century career and learning goals that are now imbedded into Common Core. (personal communication, May 22, 2017)

Additional instructional practices shared included feedback online instead of on paper which saved paper and resulted in collaborative feedback. For example, Aiden stated, “With them sharing their work with me I can now provide more detailed feedback for assessments” (personal communication, May 23, 2017). Sue added, “It is a great way for them to collaborate with one another and to share it out with me so there is less paperwork” (personal communication, May 22, 2017).

Teachers appeared to be evenly divided on the theme element of changing assessments of student work. For example, Google has an app called Google Forms that can be used as an assessment tool. Kelly said, “I do a lot of online assessment, a lot of Google Forms assessments” (personal communication, May 25, 2017).

Figure 1. Theme 1 Teacher Attitudes and Instructional Practice



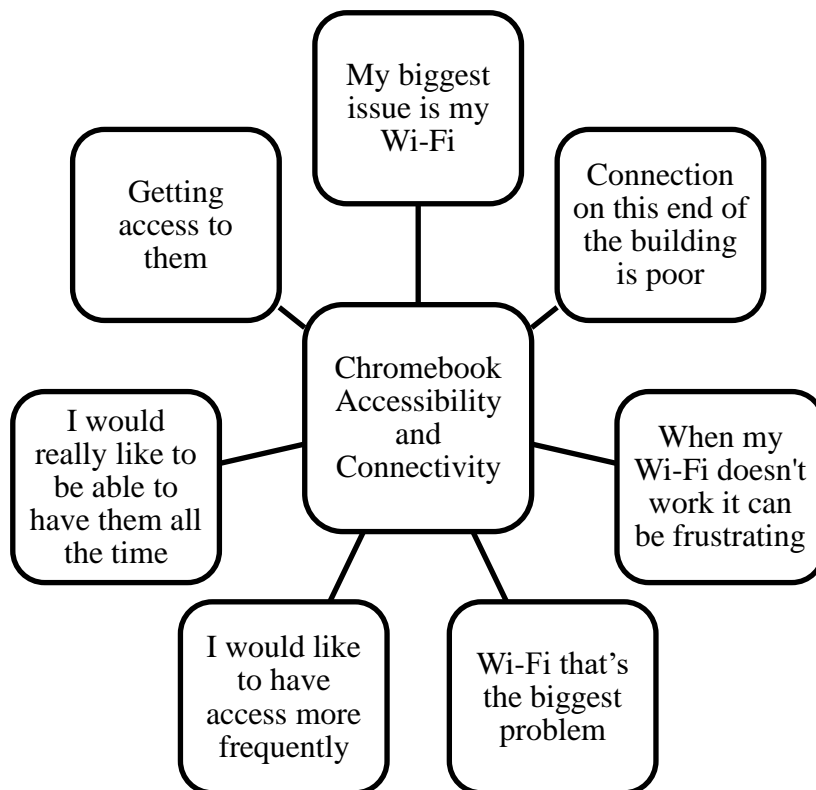
Theme 2: Chromebook Accessibility and Connectivity

The second theme revealed that teachers wanted more Chromebooks and a more reliable Internet connection. The first part of this theme revealed participants dissatisfaction due to the Chromebooks not being accessible all the time due to the limited amount of Chromebook carts in their buildings due to the carts being shared with colleagues. Multiple participants expressed if they had their own Chromebooks for their classes, they would use the technology more. This is expressed by Aiden when he said, “I welcome it and I wish that I had my own cart that [I] didn’t have to share cause I think that I would use them on a regular basis.” (personal communication, May 23, 2017). Grade 7 Social Studies teacher Deb agreed and stated, “I think even the availability of the Chromebook, we do have three for our team but we were kinda scrambling who’s using them, so that’s an issue” (person communication, June 5., 2017). Not having enough Chromebooks was also shared by Kim when she expressed her disdain with the Chromebooks

due to the limited availability, for there were only two Chromebook carts for multiple grades to share. Theme 2 was reinforced by Kim's response that her school only has two Chromebook carts for an entire school. She said, "The Chromebooks on the other hand are driving me over the edge because we don't have enough" (personal communication, May 24, 2017).

In addition, most participants shared and expressed their experiences with the wireless connection noting that the wireless connection was not reliable. The majority of teachers shared their frustration with connectivity issues at times of planned instruction with the Chromebooks. The theme of connectivity was reinforced by Cynthia who commented, "Somedays I have no Wi-Fi connection somedays I have half the room with Wi-Fi, so we all sit on one side of the room" (personal communication, June 8, 2017). Ann shared similar experiences as Cynthia and the others and expressed, "The only thing I've had to deal with that stressed me was the network" (personal communication, May 22, 2017). Pam also expressed her frustration with the wireless connection in her classroom when she said, "So I've been using the cart but in the library because every time we try to use it, I'm ready to throw it out the window because my Wi-Fi, cause they'll [tech department] say you have it, I'll get the cart, no we don't, no I don't" (personal communication, June 5, 2017).

Figure 2. Theme 2 Chromebook Accessibility and Connectivity.



Theme 3: Student Learning

Theme 3 includes various aspects of student learning including motivation, engagement, improved behavior, and increased production of work. Theme 3 was developed based upon significant statements that were repeated in multiple individual interview transcripts. Theme related phrases that were found across the participants transcripts included student engagement, accountability, behavior, and increased production of work.

With regard to the theme element of accountability, Aiden stated, "I think it holds students more accountable for quality work" (personal communication, May 23, 2017)". Behavior was also an aspect of student learning for instance, Aiden added, "...cause the kids are really good with it and behave I feel like better, when there is a Chromebook in front of them.

(personal communication, May 23, 2017). Accountability was also reinforced with Sue's statement, "...self-check quizzes, and videos for students to use to enhance their learning and have them more accountable for their work.

Science teacher Catherine shifted the focus to engagement and stated, "They're much more independent because they know how where the information is and how to access it. For some they're much more engaged with that then if I am lecturing to them." (personal communication, May 25, 2017). Ruth expressed a similar sentiment and said it, "...helps them to become more proficient writers too because they actually are engaged in this process rather than writing something, handing it in, then getting back, and the revision technology that exists" (personal communication, June 6, 2017).

Ruth also discussed behavior, noting "We would have far few behavioral issues if we were accessing Chromebook training on a regular basis...it eliminates some of those behaviors" (personal communication, May 17, 2017). Ann further discussed behavior and observed, "I enjoy using them, the kids enjoy using them, they're quiet. I have less behavior issues when I use them" (personal communication, May 22, 2017).

Finally, the increased production of student work was also a student learning theme element that was shared among the participants. For example, Grade 4 teacher Karen said, "I think they approach writing with a positive attitude because they really want to use the Chromebooks." Catherine expressed the same perception and stated, "They definitely produce more work when they're on the computers than pen and pencil (personal communication, June 6, 2017). Sue joined on the response and stated, "I think again, that's bringing some new love for math to some, because they realize oh that I can even use Chromebooks...and I think that's

important for them to see that math isn't just on a piece of paper.” (personal communication, May 22, 2017).

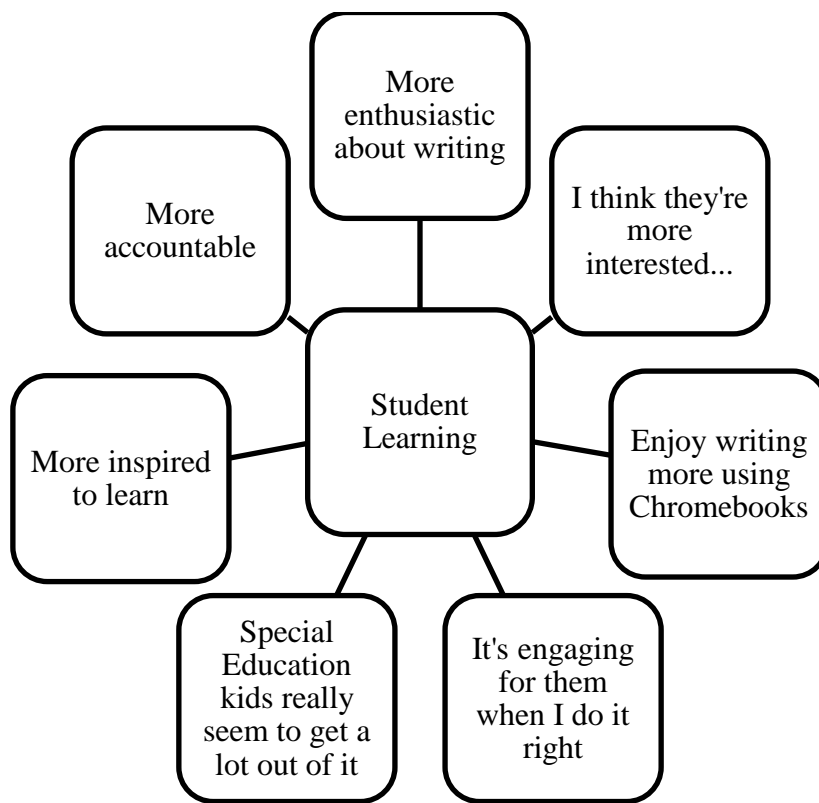
Several positive words and phrases supporting Theme 3 and related to student learning were distilled from almost all of the interview transcripts where the participants described their students' feelings about using GSFE with Chromebooks in the classroom. Figure 2 represents a word cloud generated based upon the repetitive shared descriptions by the participants.

Figure 3. Word Cloud of Student Attitudes



Similar to the visual representations of Themes 1 and 2, Theme 3 is represented by Figure 4 illustrating the shared theme components.

Figure 4. Theme 3 Student Learning



Theme 4: Inconsistent Training and Support

The fourth major theme that was shared by the participants regarded the inconsistent training and support experiences. Shared experiences with professional development across the participants included both the frequency of training and the level of specificity.

With regard to the frequency of training in the use of GSFE and Chromebooks, multiple participants noted they had not participated in current professional development offerings or had never received formal training on the Chromebooks. At the time of the study, multiple participant trainings had occurred one to two school years prior. Individual interviews and focus group interviews revealed that teachers were not current in their trainings due to having to take other required professional development trainings which resulted in a lack of time and opportunity for Google professional development. Regarding professional development

opportunities, Catherine said, “They’re limited” (personal communication, June 5, 2017). Pam similarly expressed, “I don’t feel like we have a lot it” (personal communication, June 5, 2017). Sue joined in and stated, “Right but then it’s hard because you have to take other classes that are required so we don’t have the opportunity to take the electives” (personal communication, June 5, 2017). Regarding the importance of the training, Ruth said, “Absolutely essential [profession development] it should be mandatory, rather than the behavioral components [mandatory workshop]” (personal communication, May 17, 2017). Deb also suggested mandatory professional development, “So, that I think, I would like to see it [professional development] be kind of a mandatory district wide, everybody needs to do this” (personal communication, May 18, 2017). Participants generally agreed and expressed a desire to have consistent professional development by using staff meetings and working with a teacher support colleague well-versed in the technology. Jan expressed,

I guess if you are going to ask people to use it that consistent professional development, but not so formal in a big room of hey everybody, you know all 700 of you, here is what we’re going to do. But more like a one on one person, who can at one faculty meeting every month this person is available that if you have challenges or if you have questions. Or even, I know we had the luxury of having Faith do that for a while. (personal communication, May 31, 2017)

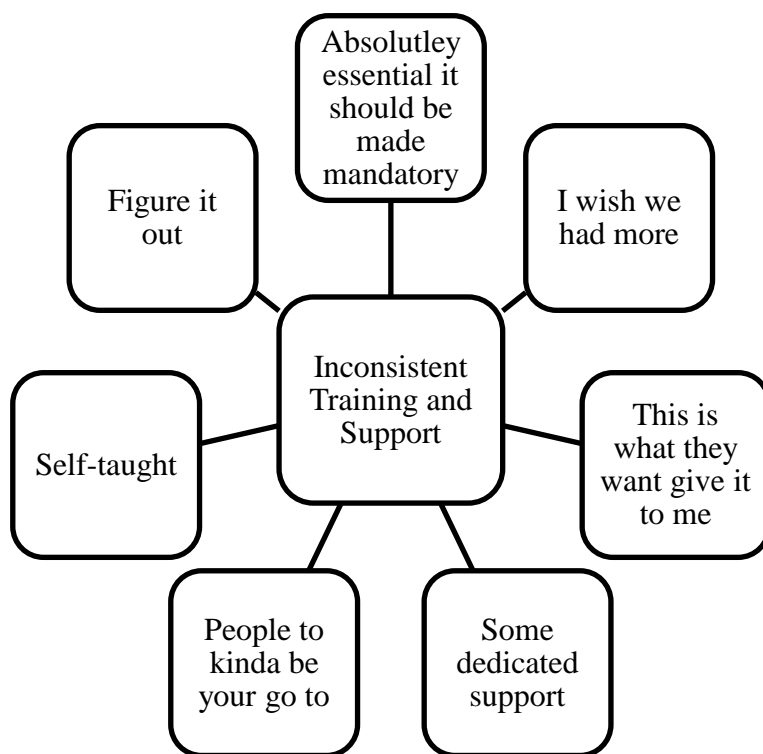
Participants expressed that professional development needs to be specific to their grade level and subject which needed to include student examples so they could see the value in it. Cynthia shared her experience and voiced her suggestion for specific training. For example, Cynthia noted, “When I left I was overwhelmed from so much information. Instead of having a

large overview I would benefit from a focus on Google Classroom...Google Slides” (personal communication, June 8, 2017).

Participants generally agreed that their most reliable source of support was each other. Terms such as “self-taught,” “peer support,” “ask a colleague,” and “figure it out” were mentioned numerous times. One focus group underscored this theme when they stated they did not have any support besides peer support. Teachers were reaching out to others for support or trying to learn on their own. For instance, Ruth stated, “Um well it was great while we had Faith as the IT teacher helper because if I had like a general idea of what I thought could be done, she knew definitely, you can use this, you can use this...” (personal communication, May 24, 2017). In agreement with the need for dedicated support Sue stated, “Yup some dedicated support. Even if it’s ...one particular person, have one person per grade or something like that” (personal communication, June 5, 2017). Karen shared the same view and stated, “Maybe ask a teacher per grade or a couple of people to kinda be your go to and show things to other people” (personal communication, June 5, 2017). Cynthia included suggestions for professional development and also support personnel for she said, “Lots of professional development. Having a base person that someone can go to, to ask questions with great knowledge of the programs” (personal communication, June 8, 2017). Jan suggested to other schools, “Make sure they have training for folks, consistent policies, access to the Chromebooks on a regular basis for everyone to make sure that people continue to use them so that it becomes a regular tool” (personal communication, May 31, 2017).

Figure 5 below shows key phrases by participants placed into the theme cluster.

Figure 5. Theme 4 Inconsistent Training and Support



Theme 4 revealed teachers believed they did not have consistent or specific professional development. Participants were looking for mandated trainings or regular staff meetings where someone would show relevant student work and how to use the tools. Participants believed that professional development should be in a scaffolded-type form and should be specific to content area, grade level, and include examples. In addition, the participants shared a common response of lack of support. Multiple participants discussed the need for a support staff for each building or grade level that they could go to for support. They all shared that they either were figuring it out on their own or asked a colleague.

Central Question

The four themes developed from the data collected for the study revealed how grade 4-8 public school core content teachers perceived the overall experience of using G Suite for Education with the Chromebooks in the classroom. In the following four subsections, I have used the themes that developed during my investigation to answer the research questions of the study.

The central question of the study was: How do grade 4-8 public school core content teachers perceive the experience of using G Suite for Education with Chromebooks in the classroom?

Theme 1 revealed the majority of teachers' have a positive attitude towards GSFE and Chromebooks. Even though participants may have been unsure of themselves in the beginning their attitude towards GSFE and Chromebooks and instructional practice revealed that over time their attitudes increased or continued to stay positive. Data analysis also revealed participants' most common perceptions of GSFE and Chromebooks as, "overwhelmed at first," "I loved it," "more positive," "skepticism replaced with confidence," "easy to maneuver," and "liked it right off the bat". For instance, Pam noted, "It was actually very positive" (personal communication, June 6, 2017). Ruth, who was skeptical at first and then changed her mind, said "My attitude at the beginning was possibly a little skeptical but overtime my skepticism has been replaced with confidence and assurance of its value" (personal communication, May 17, 2017). After using it overtime Karen added, "It's awesome, I mean I think that it's especially great when writing long like when they wrote their narratives some of them are multiple pages" (personal communication, June 1, 2017). Kim also said she loved GSFE but did not like the Chromebooks because of accessibility.

Themes 2 and 3, which were also central to understanding teachers' perception and experience of using GSFE with Chromebooks, revealed the majority of teachers had shared

connectivity issues with the wireless network and difficulty getting Chromebook carts due to not having sufficient carts to share among teachers for each building. However, although teachers were challenged with connectivity and Chromebook accessibility issues they continued to see the benefit of using both in their classrooms and wanted even more Chromebooks to accommodate their increased use. Summing up this sentiment for the entire group, Ann said, "...we would use the Chromebook everyday" (personal communication, June 6, 2017). Aiden, who also wanted every student to have their own Chromebook, said "If we had students get their own Chromebook and we supplied everything else they need that would be perfect" (personal communication, June 6, 2017). For instance, Beth added, "I would suggest um having one Chromebook cart per team if possible and that would cut down on all of these scheduling problems that we have. I think that would be great" (personal Communication, June 6, 2017). Even though the majority of participants experienced consistent connectivity issues, they continued to use the Chromebooks or would solve their own connection problems by simply moving students to a different area in the room or they would conduct class in a different location.

Theme 3 revealed teachers perceived that student motivation and excitement increased when using Chromebooks and they noted the positive impact it had on their learning. For example, Ruth said, "It surpassed my expectations in terms of classroom participation and presentations by students and it made their world a lot easier. Particularly with students with writing disabilities who can only type" (personal communication, May 15, 2017). To cope with connectivity issues Cynthia moved her students to a different part of the classroom and said, "Somedays I have no Wi-Fi connection, some days I have half the room with WiFi, so we all sit on one side of the room" (personal communication, June 8, 2017).

Finally, theme 4 revealed teachers' shared perceptions that although they were lacking in professional development, they continued to use the Chromebooks in their classrooms and were self-taught, or would seek colleagues for help. Colleagues seeking help from another was expressed by Beth, "I'm not a computer expert by any means and yet I feel like I have a pretty good control of it and I always think is funny when someone comes to me with a question because I'm not usually that kind of an expert but I'm not afraid of it" (personal communication, May 24, 2017). For teachers interested in using GSFE with Chromebooks Aiden stated, "I think they should look into ways that they can educate themselves on how to use it whether ask another colleague who's willing to show them different features" (personal communication, June 23, 2017). Grade 4-8 teacher overall perceptions of GSFE with Chromebook were positive. Data revealed they would like more Chromebooks to be available, increased bandwidth, and an increase in training and support.

Sub-question 1

The first sub-question of the study was: How do grade 4-8 public school core content teachers perceive the impact of integrating G Suite for Education on teaching pedagogy? Grade 4-8 public school core content teachers perceived the impact of integrating G Suite for Education on teaching pedagogy as revealed in theme 1 to have impacted their instruction by shifting it from teacher-led to student-focused. Many participants shared that due to the collaborative nature of using G Suite for Education, they were able to give more feedback and were able to provide students with technology tools that increased their accountability and knowledge of the curriculum. For example, Pam shared, "I can give them feedback or help them edit it." (personal communication, June 5, 2017). Ann found it helped with differentiating instruction and said,

I think it allows me to be more differentiated when it comes to creativity and typing, and writing, and processing. So kids who are not good at writing by hand, have a different means to present and write and think and organize. So...I think that's the best (personal communication, May 22, 2017).

Participants also shared that using G Suite for Education worked well with their curriculum and Common Core during writing, presentation, or production of projects. Student creation of projects was shared by Ruth, "They're able to identify their own writing weaknesses, improve on them, and then produce something that communicates with details that they're trying to persuade. So, the communication tool is exemplary for production" (personal communication, May 17, 2017). Deb discussed collaboration and the Common Core and said, "It's very conducive to Common Core because Common Core is so collaborative, I think that makes it much easier for Common Core" (personal communication, May 18, 2017). The shared experiences revealed in theme 1 regarding the variety of ways GSFE and Chromebooks impacted teaching included instructional delivery using lessons focused on research, presentation of lessons, posting of learning resources using Google Classroom, using Google Docs to enhance student writing, incorporating Google Slides for presenting information, and enhanced feedback and communication between students and teachers.

Sub-question 2

The second sub-question of the study was: How do grade 4-8 public school core content teachers perceive the impact of using Chromebooks in the classroom on student learning? Grade 4-8 public school core content teachers perceived that using Chromebooks in the classroom impacted student learning in that it enhanced student motivation, engagement, and work production. Theme 2 revealed an increase in student motivation that resulted in increased work

production. Multiple participants shared how students were motivated to learn and more engaged in the learning process because they enjoyed using the Chromebooks. For example, Ann said, “I think they are more enthusiastic about writing. When the Chromebooks come in instead of saying ugh we’re writing, oh good we’re writing so that’s a positive” (personal communication, May 22, 2017). Teachers also noticed that students took more of an interest in their learning. Students were found to be motivated for Karen stated, “I just think they’re more interested, I think they’re um really enjoy the typing...so they’re enthusiastic, I think” (personal communication, June 1, 2017). Additional teacher comments about student motivation included Ruth’s statement, “They are much more motivated...this is their world, so they do engage far more for the most part, most of them” (personal communication, May 17, 2017). Shared key terms such as “enthusiastic,” “motivated,” “excited,” and “engaged” were found during analysis. Students were essentially found to be more accountable for their learning. For example, Sue said, “Well one thing I think has changed is making them more accountable for their own learning...” (personal communication, May 22, 2017). Beth also added, “They definitely produce more work when they’re on the computers than pen and pencil” (personal communication, June 6, 2017). Deb agreed, “I think it takes their learning to a different level” (personal communication, June 5, 2017). Student work was described to be improved for Pam shared, “So I get better work from them with that stuff then I would if they would have to write it out at home” (personal communication, June 5, 2017). For sub-question 2, the study shows teachers perceive that using Chromebooks in the classroom has a generally positive impact on student learning.

Sub-question 3

The third sub-question of the study was: How do grade 4-8 public school core content teachers describe technology support and training integrating G Suite for Education? As

discovered in theme 4, grade 4-8 public school core content teachers described technology support and training as both insufficient and inconsistent. Theme 4 discovered multiple participants who discussed the need for a support person and recommended to other schools interested in integrating GSFE with Chromebooks that they have dedicated support. Several times the terms such as “figure it out,” “self-taught,” and “each other” was found throughout analysis of the data. For example, Karen stated, “Cause it’s not like you can access the tech person during the day. So you have to either figure it out or decide you’re not doing it” (personal communication, June 5, 2017). Sue, who described the shared experience in one sentence, said, “Other than what we create on our own or ask help from others there’s not set supports” (personal communication, June 5, 2017). In addition, when discussing how districts can better support teachers, Deb said, “It should be a priority in the budget. The bandwidth, the Wi-Fi, hiring personnel that’s what they do because if not what’s the point you know” (personal communication, June 5, 2017). Suggestions were also made to have a support person in buildings. Beth said,

It would be great if there was somebody in the building that you knew of you could go talk to if you were having issues. I don’t know if that would be like a stipend position or something somebody you knew you could send a question to or stop by and talk to if you were having problems. (personal communication, June 6, 2017)

In addition, theme 4 revealed how the majority of participants had out-of-date training due to mandatory professional development in areas other than using GSFE with Chromebooks. Sue described the difficulty in taking GSFE with Chromebook trainings shared, “Right but then it’s hard because you have to take other classes that are required so we don’t have the opportunity to take electives” (personal communication, June 5, 2017). Ruth added, “However we are always

mandated to go to other ones [trainings]” (personal communication, June 6, 2017). Participants agreed they would attend Google trainings if given the opportunity. For example, Deb said, “I wish we had more” (personal communication, May 18, 2017). For sub-question 3, the study found that teachers shared a common experience of lack of support and consistent training using GSFE with Chromebooks.

Summary

The purpose of this phenomenological study was to examine the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the core curriculum.

In examining the lived experiences of grade 4-8 public school teachers using GSFE with Chromebooks to integrate technology into the core curriculum four major themes were developed. Teacher experiences were found to be shared across the four main themes that included teacher attitudes and instructional practice, Chromebook accessibility and connectivity, student learning, and inconsistent training and support.

The participants shared similar attitudes in which they were either unsure of themselves or skeptical when they first started using GSFE with Chromebooks in their classroom; however, as time passed their attitudes grew more positive for some while others enjoyed it from the start. Participants shared the same experience with their teaching practice that included changing to a student-centered approach, increased collaboration, GSFE with Chromebooks enhancing differentiated instruction, using Google Classroom to post course resources to further student learning, and using the various apps to enhance or compliment their teaching. Participants also shared the perception of students being more engaged and motivated in their learning. Students overall enjoyed the Chromebooks which led to increases in student engagement and productivity.

The Chromebooks motivated students to produce a variety of work and writings which also contributed to more feedback to the students from the teachers. Teachers agreed that students were motivated, excited, engaged, and produced more writing.

Another shared perception was the constant struggle with wireless connectivity in the various district buildings. Participants shared their frustration with needing to rearrange their rooms or relocate their classes in to use the Chromebooks. The participants also discussed the need for additional Chromebooks. Three participants noted that even though they could see the potential of using the Chromebooks, due to the lack of availability they had not experienced it firsthand. Support and training was another area of shared concern among participants who continued to use GSFE and Chromebooks while relying on self-instruction or reaching out to colleagues for assistance.

The shared experiences of teachers using GSFE and Chromebooks revealed indicated that schools looking to implement GSFE and Chromebooks need to budget for technology, properly train staff and students, have the infrastructure to support the devices, implement trainings during staff meetings, and provide technical support. The overall experiences of the participants revealed that they have a positive attitude towards using GSFE and Chromebooks; they are frustrated with connectivity and accessibility; students feel motivated to use GSFE with Chromebooks; and participants express the desire for more Chromebooks and bandwidth. In general, although the participants faced obstacles, they shared resiliency to continue using GSFE and Chromebooks.

CHAPTER FIVE: CONCLUSION

Overview

The purpose of this phenomenological study was to examine the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the core curriculum. In chapter five, a summary of the findings of the study are further discussed along with the theory and empirical findings in relation to the research. Implications for school leadership administration, technology department leaders, and higher education institutions and teachers are discussed. Furthermore, the chapter concludes with delimitations and limitations of the study, recommendations for future research, and a final summary of the research.

Summary of Findings

The study took place at Magnolia School District located in the northeastern United States. Participants included 13 grades 4-8 core content teachers who had experienced integrating Google Suite for Education with Chromebooks into their curriculum. Participants shared their experiences through individual interviews, focus group interviews, and journals. Four major themes were developed from the data and are used in this chapter to identify the textural and structural descriptions of the shared experiences of the participants. The teachers shared lived experiences included: a positive attitude that increased with use overtime; an increase in student learning and motivation; consistent wireless connectivity issues and difficulty accessing Chromebooks due to limited availability; and, lack of support with inconsistent professional development.

The central question guiding the study asked: How do grade 4-8 public school core content teachers perceive the experience of using G Suite for Education with Chromebooks in the classroom? The majority of participants in the study shared a positive attitude toward GSFE

with Chromebooks. Even though participants shared connectivity and Chromebook accessibility issues with limited training and support their attitudes toward GSFE with Chromebooks were positive.

The first sub-question asked: How do grade 4-8 public school core content teachers perceive the impact of integrating G Suite for Education on teaching pedagogy? The majority of the participants discussed how using GSFE with Chromebooks enhanced their teaching, increased feedback through collaboration, and allowed for resources to be posted for students. They also noted a shift from teacher-led instruction to student-centered instruction, increased collaboration between students, and an increase in opportunities to differentiate instruction through use of Google Classroom, the presentation of the lessons, and the various apps the participants used with their students. Furthermore, teachers were divided on the theme element of changing assessment of student work.

The second sub-question asked: How do grade 4-8 public school core content teachers perceive the impact of using Chromebooks in the classroom on student learning? The theme of student leaning revealed that participants saw an increase in their writing and found their students to be more motivated and engaged in learning. Multiple participants shared that their students were more engaged when using the Chromebooks. Participants also noted that students produced more and improved writing on the Chromebooks and were excited about the writing process. Furthermore, teachers found that using GSFE and Chromebooks made their students more responsible for their learning. Participants described typical student responses to using the Chromebooks as “love it,” “like it,” “fun,” “engaged,” and “excited.” Students were motivated to use the Chromebooks which resulted in increased student work productivity.

The third sub-question asked: How do grade 4-8 public school core content teachers describe technology support and training integrating G Suite for Education? Participants shared there was not enough support and suggested there should be a support person to help teachers in the use of GSFE and Chromebooks. Common phrases and terms used to describe support included “self-taught,” “figure it out,” or “on the job training.” Multiple participants suggested there should be a support person per grade or a colleague that would be paid a stipend to help assist teachers with GSFE. Individual interviews and focus group data revealed participant training generally occurred one to two school years prior to using the technology or that they never received the training. In addition, participants shared they were lacking in consistent training due to other mandatory professional development workshops that prevented them from being able to take technology workshops. Participants shared their desire to continue using GSFE with Chromebooks was self-initiated. Furthermore, participants recommended that other schools seeking to implement GSFE with Chromebooks need to provide ample bandwidth to support devices and training for staff.

Discussion

Because current research on Google Suite for Education with Chromebooks is very limited, the research was developed to understand the lived experiences of public school teachers using G Suite for Education with Google Chromebooks integrated into the core curriculum. During the study, I discovered that the participants’ attitudes toward using GSFE and Chromebooks generally improved over time. This finding aligns with Albert Bandura’s social cognitive theory (1986) and can be used to further develop an understanding of teacher adoption of technology integration.

Theoretical

Personal agency, which includes a self-efficacy component, sheds new light on the topic of technology integration and can be used to develop a deeper understanding of teacher attitude and willingness to use GSFE with Chromebooks. Theme one of this study included teacher attitude as it relates to teacher perception of self-efficacy. This theme was observed as teachers faced external barriers as noted by (Ertmer, 1999) which included access to technology and wireless connection issues. This study found that teacher beliefs remained positive and were determined to use GSFE with Chromebooks. Even though participants faced external barriers such as Wi-Fi connectivity and availability of shared Chromebook devices they continued to develop a positive attitude towards technology. Participants discussed support as self-taught or ask a colleague and in doing so the participants became self-directed and willing to use technology. Bandura's social cognitive theory can be used as a lens to develop further understanding of adoption of teacher willingness to adopt technology. Eleven out of 13 participants expressed positive attitudes towards using GSFE with the Chromebooks which showed they had a high level of self-efficacy. Two participants in the study revealed that they were unsure of their feelings for they were not comfortable with using the Chromebooks due to limited access to getting the Chromebooks or not comfortable with the formatting features in Google Docs as with MS Word. Limited access to the Chromebook can be identified as external barriers which corroborates with past research (Ertmer, 1999) on teacher barriers to technology integration which included access to computers and the Internet. The study results and associated theme of teacher attitude and instructional practice suggests that the majority of teachers had a high level of self-efficacy. Participants attitudes and practice is consistent with current research

(Overbaugh, Lu, & Diacopoulos, 2015) on self-efficacy and its effect on willingness to integrate technology and the degree of their integration.

Empirical

As noted, scant research exists on the use of GSFE with Chromebooks. For example, related literature was focused primarily on Common Core Standards, collaboration, teacher attitudes, and professional development. Therefore, theme one seeks to fill this gap in the literature with the findings about improved teacher attitude and instructional practice that resulted from using GSFE with Chromebooks. Theme one also suggested that the majority teachers had a positive attitude. If viewed through the lens of Bandura's social cognitive theory, these teachers could be interpreted as possessing a high level of self-efficacy. While not the focus of this study, this finding is important and was apparent in participant responses such as, "My attitude at the beginning was possibly a little skeptical but overtime my skepticism has been replaced with confidence and assurance of its value" (Ruth, personal communication, May 17, 2017). Regarding the relationship between teacher attitude and teaching practice Aiden shared, "I loved it and I just honestly was able to just think about different ways I could improve my instruction" (personal communication, May 23, 2017). Previous research indicated that teacher and student attitudes became negative overtime when using technology (Sahin et al., 2016). However, participants in my study shared they were unsure at first but then had an increased attitude or confidence level. For example, Deb said "Like I said, I'm feeling more confident I think every day" (personal communication, May 18, 2017).

In addition, theme one, that included a teaching practice element, found participants incorporating various learning situations for their students including Google's sharing

capabilities that led to collaboration between students, teacher, and peers. Participants shared the variety of ways they used GSFE with the Chromebooks that included using Google Docs for writing and sharing, posting lesson resources to Google Classroom, and the use of Google Slides for research and collaboration. For instance, Catherine shared, “I think it’s brought in a lot more student driven activities and more I use it a lot with inquiry-based learning” (personal communication, May 25, 2017). Participants shared multiple ways in which they are using GSFE in their classroom from incorporating writing, collaboration, simulation, visuals, using web 2.0 tools, and project based learning which is aligned with the Common Core. Multiple participants shared that they were able to provide feedback in student’s writing. Beth shared her experience with Common Core and the sharing tool, “Okay well obviously teaching English we do a lot of writing and Google Docs is great for that and can you know give them formats it can I can make comments as they’re going along” (personal communication, May 24, 2017). Collaboration using GSFE aligns with previous research by Yim et al. (2014) who identified Google Docs as having the capability to meet a collaboration standard.

Theme 2 of this study included Chromebook accessibility and wireless connectivity. Both were issues discussed during individual interviews, focus groups, and journal entries. Participants shared that they would like to have increased access to the Chromebooks. Previous research (Ertmer, 1999) focused on understanding teacher attitudes towards integrating technology found access to be a barrier to technology integration. A later study by Ertmer et al. (2012) confirmed their earlier findings that teachers with a high use of technology can be discouraged from using them due to barriers such as lack of access. Ertmer’s (1999) research was relevant to my study because participants were resilient but noted the importance of having another plan in place. For example, Beth said, “I would also suggest having one Chromebook

cart per team if possible and that would cut down on all these scheduling problems that we have. I think that would be great” (personal communication, June 6, 2017). Participants suggested that schools increase the amount of Chromebook carts per team and the carts should be logistically located throughout a building where they can be easily accessed. Theme 2 also included the persistent shared experience of difficulty with wireless connectivity and corroborated previous research (Sahin et al., 2016). Many participants shared their frustration with inconsistent wireless connection. Pam said

Well that was fun! NOT!!! After modeling the slide show and the first steps to the assignment we were unable to log on to the computers. We called for tech help and were told this was the challenge of working with technology.

Deb similarly said, “They can keep getting us Chrome carts and iPads but if you don’t have the support and certainly don’t have the WiFi what’s the point” (personal communication, June 5, 2017). The connectivity issues found in my study are consistent with previous research by Sahin (2016) and Saine (2012), who both found that participants faced barriers to technology integration due to bandwidth issues. Marcoux (2013) also noted that network reliability has an effect on those using it and that it can be frustrating. Furthermore, schools have shared the importance of having the proper infrastructure as being more important than the device (Schaffhauser, 2014).

The third theme developed from the participants’ responses about their shared experiences indicated when using GSFE and Chromebooks students were more accountable for their work, were more motivated to do their work, were more engaged in learning experiences, and showed improvement in writing. These results are consistent with previous studies (Brown & Hocutt, 2015; Robertson, 2013) focused on using the Google Docs sharing tool to increase

collaboration and enhance writing. Cynthia illustrated this alignment with previous research when she shared her experience with the writing process by noting, “The writing process is more manageable; I have 100 students, [it is] far easier to go on computer, proofread, edit work with suggestions than have stacks and stacks of papers with poor handwriting” (personal communication, June 8, 2017). Most of the participants shared that students were excited to use the Chromebooks. Participants commonly used descriptors such as “love it,” “like it,” “excited,” and “engaged” to describe how students felt about using the Chromebooks. Student motivation and excitement towards using Chromebooks aligns with previous research (Palaigeorgiou & Grammatikopoulou, 2016) that discovered students using Web 2.0 technology were engaged in producing work with collaboration. Shapley et al. (2011) also found that in addition to an increase in student collaboration in the 1:1 environment, there is also a decrease in student discipline. Although this finding was not the focus of my study, it is worth noting the discovery as Ann expressed, “...I have less behavior issues when I use them [Chromebooks]. I don’t have to remind boys and girls to stay on task so often” (personal communication, May 22, 2017).

Inconsistent training and support was identified as the fourth theme in my study. Two participants in the study were current in their training while the remaining participants had not attended professional development for one or more years. Participants shared that due to mandatory trainings on other topics, they were unable to enroll in technology workshops. This shared experience of the need for consistent training corroborates with existing studies that found teacher willingness to integrate technology corresponds with schools providing ongoing professional development and support (Beriswill et al., 2016; Ottenbreit-Leftwich et al., 2010; Overbaugh et al., 2016). In addition, participants shared that they were “self-taught” or asked a colleague for needed assistance and support. For example, Deb said,

Yeah, I think there needs to be professional development on it. I think there needs to be ... you know it was nice to have personnel that were in the building that could come in and actually do lessons. That was very beneficial because when you have an expert come in and do the lesson not only are the kids learning, the teacher was learning by actually seeing it. If there could be I think having some kind of Google liaison in a dream world at every school would be ideal you know someone to answer any questions you had or introduce hey look at the great new thing from Google that would be ideal I think.

The literature revealed that the role of a technology coach could remove various barriers to teachers integrating technology (Lowther et al., 2008). Similarly, a technology facilitator was found to have an effect on teacher attitudes (Stanhope & Corn, 2014). Both findings align with the findings of my study underscoring the importance of support and consistent professional development as important components of teaching with technology. For example, in my study the participants continued to use GSFE with Chromebooks even as they faced some barriers and their willingness to remain positive was evidenced by their high self-efficacy in using technology.

Implications

The results of my study examining the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the core curriculum can provide stakeholders such as school leadership administrators valuable information regarding the implementation of GSFE with Chromebooks in their school system. This study could also provide technology department leaders an awareness of the technology barriers and situations that teachers face in the classroom. Furthermore, the results encourage

opportunities for higher education pre-service teacher programs and teachers to learn from other teachers' experiences using GSFE with the Chromebooks.

School Leadership Administrators

The findings of this study provide individuals in all positions of school leadership with valuable information that could drive their decision-making process when implementing Google Suite for Education with Chromebooks. The results of the study clearly imply a need for schools to have adequate technology budget allocations to ensure enough Chromebook devices, support personnel, and professional development specific to teachers' needs.

Professional development is needed for school administrators because they play an important role in technology adoption (Berrett et al., 2015; Machado & Chung, 2015; McLeod, 2015). Best practices in professional development should include the use of staff meetings to provide examples of student work with an emphasis on specific applications and how they can be used specifically in the classroom. Results of the study also imply that participants need professional development in the use of GSFE and Chromebook that is required, consistent, and specific to grade level and subject. This implication is aligned with findings of Beriswill et al. (2016) who discovered professional development that includes CCSS, collaboration, and integration of a variety of online resources specific to a teacher's content area can have a positive impact on teacher technology integration. Participants also generally agreed that professional development should not be a mere generic overview of how to use GSFE with Chromebooks, but should be specific to their content area. For example, Karen shared, "When it's at your own grade level it means something to you cause that's your own curriculum" (personal communication, June 5, 2017). In addition, participant responses indicated strong teacher sentiment to see student examples in order to decide how using GSFE with Chromebooks adds

value to their teaching. For instance, Pam said, “I think if people saw what kids actually get out of it, like saw those finished products, they might be more excited about it and realize the value to it” (personal communication, June 5, 2017). Similar to the findings of my study, past research (Ottenbreit-Leftwich et al., 2010) discovered that if teachers believe technology use adds value they will use it. This study’s findings imply that teachers are in need of proper technology support such as a technology coach per school building who provides assistance in modeling instruction and is available to answer questions when needed. This implication is consistent with previous research supporting the positive impact of technology coaches on integration (Lowther et al., 2008).

Technology Department Leaders

This study also implies the need for a proper infrastructure to be in place in order for Chromebook devices to be implemented in the learning environment. My study found that wireless connectivity, when not reliable interrupts instruction and learning. Teachers expressed frustration when bandwidth and connection chronically stopped working on devices that were dependent on wireless connectivity. For example, Pam shared, “I don’t know. I almost threw that cart out the window during ----- [state test]” (personal communication, June 5, 2017). Similar to the findings of my study, Marcoux (2013) found that teachers are frustrated when the network is not reliable. This is further corroborated with the research of Koch et al. (2016) who noted there are times during the school day where there is more demand on the network which can impact network capacity.

Professional development and technical issues were also defined in the literature as barriers to integration of technology (Beriswell et al., 2016; Kopcha, 2012; Sahin et al., 2016). The findings of this study, supported by the findings in the greater body of existing literature,

imply that technology department leaders should work with school leadership to ensure that adequate finances are allocated for schools to provide proper infrastructure to support multiple devices and users sharing a network free of degradation or connection interruptions.

Higher Education and Teachers

The findings of this study imply that the need for higher education leadership and pre-service teaching programs provide courses where students learn to use technology and more importantly learn how to integrate technology into the curriculum. Past research (Hughes, 2013) shows that pre-service teachers, even in a 1:1 program, lack pedagogical and content knowledge when integrating technology. More formal training is needed for pre-service teachers that do not receive training (Worch et al., 2012). A final implication of my study is that as schools increasingly transition to 1:1 programs or increase their use of Chromebooks, it will be important for pre-service teachers to learn how to use and implement the technology into their area of study. This study provides authentic examples of what teachers experience when working with GSFE with Chromebooks.

Delimitations and Limitations

This study was limited to core content teachers with three years teaching experience and at least one term of experience using GSFE with Chromebooks located at a specific school district with various numbers of Chromebook carts located in the northeastern United States

There were identified study characteristics that were limitations. The first characteristic was not being able to conduct a pilot study due to not having enough participants during the participation period. Additionally, due to initial low participation because of the purposeful sampling the criteria were broadened to include two study participants that did not have one term use of using GSFE and the Chromebooks. However, one of the participants had one-year prior

experience using GSFE without the Chromebooks, the second participant had one-year experience using the Chromebooks but not a full term using them with GSFE apps. The data collected did not show any differences in shared experiences than those that met all three requirements for data saturation was met. Additional limitations included all participants completing the online journal. Nine participants completed the journal and four did not after being reminded several times which implied participant hesitation. For example, Cynthia only completed the individual interview without audio recording and did not participate in the focus group due to not being available. In addition, multiple communications were sent to Cynthia to complete the journal however she never did possibly due to participation hesitation. Additionally, Catherine exhibited some hesitation when it came to completing the online journal and follow up interview questions. Due to her hesitation, she did not provide a journal. Kim only participated in the individual interview due to her heavy involvement with student activities; she was unable to attend the focus group. Kim did not complete the online journal even with several emailed communications

Furthermore, the timing of the research encompassed the last month of school which was a limitation due to the amount of responsibilities teachers incurred at that time which included state tests, closing of grades, end of year activities, and personal obligations. Lastly, there was a limitation geographically on the sample for it was a school district located in northeastern United States with a specific number of Chromebook carts per school which is individual to that school district.

Recommendations for Future Research

Recommendations for future research includes conducting the research at two or more similar schools that have 1:1 Chromebook programs in place. This would provide rich

descriptions of the experience teachers have in using this technology on a daily basis where access to Chromebooks is not a barrier. In addition, the timing of the research is recommended to start at the beginning of a school year and follow the teachers for at least one school term or half year. I believe that futures studies utilize a design that includes a self-efficacy or TPACK framework to measure teacher efficacy and model of pedagogy and instruction in order to provide results that can be used in future research and provide an understanding of the technology efficiency each participant has for comparison. In addition, future research should include sampling of teachers that utilize the technology frequently based upon administration knowledge of their staff's use of technology. In addition, I recommend that future research use a mixture of both quantitative and qualitative methods to measure student learning with GSFE with Chromebooks by grade level versus classes not using GSFE with the Chromebooks to understand not just how much, but how they differ academically. Further research is also needed in the area of administrator use of technology and their views since they influence the use of technology in their buildings. Future studies should also look at access among different school systems to provide rich qualitative data that could provide understanding of the impact on student learning based on a comparison of schools that do not have access to devices due to funding with those that do have devices and funding.

Summary

This study overwhelmingly found that participants believe that using GSFE with Chromebooks positively impacted their students. The study participants also consistently shared a belief that the ability to provide various ways for students to show their learning and increase feedback and communication was positively impacted by the use of GSFE and Chromebooks. Although it was beyond the scope of my study, participants showed strong self-efficacy and

determination when using the tools available to them and persisted in using the technology even though they experienced connectivity issues, limited access to the Chromebooks, and professional development trainings that were not consistent. School systems that are looking to implement GSFE with Chromebooks must ensure they have enough devices and provide consistent and relevant professional development in order for staff to have a positive attitude towards the technology and the desire to want to use it with their students. In addition, schools need to have in place the infrastructure to support the multiple devices connecting to the school network. Proper bandwidth needs to be in place prior to launching Chromebooks use in the classroom. Two of the simplest findings of the study (adequate bandwidth and frequent training) could perhaps be the most important findings of the study. However, Karen believed that teachers were their own most important resource and spoke for all the participants when she said:

Maybe ask a teacher per grade or a couple of people to be your go to and show things to other people. I think that especially at your own grade level when you have PLC's or whatever if that's part of it maybe show [and] share a lesson that you did. When it's at your own grade level it means something to you cause that's your own curriculum" (personal communication, June 5, 2017).

In essence, my study found that although teachers are resilient and can adapt to limited amounts of resources and support, schools interested in the implementation of GSFE and Chromebooks should: allocate resources to purchase the technology; provide proper, frequent, and recent staff and student training; commit to providing the requisite infrastructure to support the devices; implement trainings during staff meetings; and provide ongoing technical support. The overall experiences of the participants in my study revealed: a shared positive attitude;

increased student motivation; frustration with infrastructure and support; and, the need for additional devices.

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APPENDIX A: CRITERION QUESTIONNAIRE

The purpose of this phenomenological study is to examine the lived experiences of public school teachers using G Suite for Education with Google Chromebooks to integrate technology into the core curriculum.

Thank you for consenting to be a possible participant in the study. I would ask that you complete the following questionnaire as soon as possible to verify your eligibility to be part of this study. Thank you for completing this questionnaire in a timely manner.

Question one: First Name and Last Name

Question two: What subject(s) do you teach?

Question three: How many years have you worked at this school district?

Question four: How many total years have you been teaching?

Question five: Have you used Google Suite for Education (Drive, Docs, Slides, Sheets, Classroom, etc.) with your students?

Questions six: Have you used the Chromebooks in your classroom for students to access Google Suite for Education (Drive, Docs, Slides, Sheets, Classroom, etc.)?

Questions seven: Have you been using Google Suite for Education with Chromebooks for at least one term (45 days) or longer?

Question eight: Did you use Google Suite for Education with Chromebooks the previous academic year 2015-2016?

Question nine: How many academic school years have you been using Google Suite for Education with the Chromebooks?

APPENDIX B: INDIVIDUAL OPEN-ENDED INTERVIEW QUESTIONS

1. What has your experience been using GSFE with Chromebooks in the classroom?
2. What factors have impacted your use in integrating G Suite for Education with Chromebooks in the classroom?
3. Please describe your first impression about G Suite for Education with Chromebooks when it was first introduced to the district.
4. Please describe how you felt about G Suite for Education with Chromebooks after integrating into your curriculum for the first time.
5. How long have you been using GSFE with Chromebooks in your classroom?
 - a. How do you feel now about G Suite for Education with Chromebooks after using it over time?
 - b. What attitudes or personal perceptions have changed since you have used it over time?
6. What applications in G Suite for Education do you use with your students?
7. How has G Suite for Education impacted your teaching?
8. How did you change your delivery of the content when integrating G Suite for Education?
9. How did you change your student assessment of the content when integrating G Suite for Education?
10. Please describe the type of learning activities students participated in using G Suite for Education.
11. Have you found any changes in student learning using G Suite for Education?

12. Please describe how G Suite for Education with Chromebooks works with your subject frameworks and Common Core standards.
13. How do you perceive the use of Chromebooks in your classroom?
14. Please describe how students used the Chromebooks in your classroom.
15. Please describe how students perceive the use of Chromebooks in your classroom.
16. Please describe any professional development you have received using GSFE and Chromebooks.
17. How do you perceive professional development and support for using GSFE with Chromebooks?
18. What technical issues have you encountered when using Chromebooks?
19. What would you suggest to school systems looking to implement GSFE with Chromebooks?
20. What suggestions do you have for a colleague interested in integrating GSFE with Chromebooks?

APPENDIX C: FOCUS GROUP OPEN-ENDED INTERVIEW QUESTIONS

1. Please describe the training you received for using G Suite for Education.
2. Please describe the training you have received prior to using Chromebooks in your classroom.
3. Please describe any roadblocks that you experienced while integrating G Suite for Education with Chromebooks in your classroom.
4. How did you overcome these roadblocks?
5. What perceptions do you have on GSFE with Chromebooks on student learning?
6. Please describe any professional development or support available to you?
7. How do you feel about the current professional development activities available to you?
8. What do you suggest to other schools implementing G Suite for Education with Chromebooks in regard to technical support and professional development?
9. What advice would you give to administration for school systems looking to implement G Suite for Education with Chromebooks?

APPENDIX D: JOURNAL PROMPT**Journal Prompt**

Instructions: Each time you use Google Suite for Education with Chromebooks in your classroom with your students please type the date and write a reflection about your experience.

Please write a reflection based upon your experience today with your classes using Google Suite for Education (Google Drive, Docs, Sheets, Slides, Classroom, etc.).

APPENDIX E: INFORMED CONSENT

CONSENT FORM

INTEGRATING GOOGLE APPS AND GOOGLE CHROMEBOOKS INTO THE CORE CURRICULUM: A PHENOMENOLOGICAL STUDY OF THE LIVED EXPERIENCE OF PUBLIC SCHOOL TEACHERS

Paula J. Bartolo
Liberty University
School of Education

You are invited to be in a research study to understand the lived experiences of public school teachers using Google Suite for Education with Google Chromebooks integrated into the core curriculum. You were selected as a possible participant because you are a core content teacher having taught either grades 4-8, have three years teaching experience, and have used Google Suite for Education with Chromebooks in the classroom setting for at least one term. Please read this form and ask any questions you may have before agreeing to be in the study.

Paula Bartolo, a doctoral candidate in the School of Education Department at Liberty University, is conducting this study.

Background Information: The purpose of this study is to understand the lived experiences of public school teachers using Google Suite for Education with Google Chromebooks integrated into the core curriculum. The central question guiding this research is how do grade 4-8 public school core content teachers perceive the experience of using Google Suite for Education with Chromebooks in the classroom?

Procedures: If you agree to be in this study, I would ask you to do the following things:

1. Participate in a pilot to review individual semi-structured open-ended questions. I will meet with each of the pilot participants individually to determine whether any of the questions need to be revised. This will take no more than one hour.
2. Participate in an individual interview where the audio will be recorded. Participants will be asked to review the transcribed transcript for accuracy and suggest comment on revisions. Interviews will take no longer than one hour.
3. Participate in a focus group interview where audio will be recorded. Participants will be asked to review a preliminary analysis electronically through using Google Docs to reflect on accuracy and to provide comments. Interviews will take no longer than one hour.
4. Teachers will be asked to create a Google Doc that will be used as a digital journal shared with the researcher. Participants will be asked to use the journal as a reflection tool with dated entries each time they integrate GSFE with Chromebooks over the course of three weeks.

Risks and Benefits of Participation: The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

Participants should not expect to receive a direct benefit from taking part in this study.

Benefits to society include that the findings of the study could provide schools and teachers valuable discoveries regarding best practices and procedures for implementing and integrating Google's Suite for Education with Chromebooks in classrooms. This will help other educators in areas such as: planning, adoption, technical support, teaching, and professional development. In addition, educators will be able to learn from others in the field to make decisions based upon past research to develop best practices.

Compensation: Participants will not be compensated for participating in this study. Participants will be entered into a drawing to win one of five \$20 Amazon.com gift cards.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher will have access to the records. I may share the data I collect from you for use in future research studies or with other researchers; if I share the data that I collect about you, I will remove any information that could identify you, if applicable, before I share the data.

- I will conduct the interviews in a location where others will not easily overhear the conversation.
- The site and participant names will be replaced with pseudonyms to ensure confidentiality.
- All data will be backed up on a password protected flash drive and written accounts with field notes will be stored in a locked cabinet. Note: Per federal regulations, data must be retained for three years upon completion of the study.
- Audio recordings will be stored on the audio recording device stored in a locked filing cabinet. Only the researcher will have access to the recording device.
- Focus groups will be conducted and I cannot assure participants that other members of the group will not share what was discussed with persons outside of the group.
- After the federal regulations of the three-year period has passed all materials will be shredded, flash drive, and audio recorder will be physically destroyed.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University or Bridgewater-Raynham Regional School District. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

If you choose to withdraw from the study, please contact the researcher at the email address/phone number included in the next paragraph. Should you choose to withdraw, data collected from you, **apart from focus group data**, will be destroyed immediately and will not be included in this study. **Focus group data will not be destroyed, but your contributions to the focus group will not be included in the study if you choose to withdraw.**

Contacts and Questions: The researcher conducting this study is Paula Bartolo. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at [REDACTED] / [REDACTED]. You may also contact the researcher's faculty advisor, Dr. Kenneth R. Tierce at [REDACTED].

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 1887, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information for your records.

Statement of Consent: I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

☐ The researcher has my permission to audio-record me as part of my participation in this study.

Signature of Participant

Date

Signature of Investigator

Date

APPENDIX F: IRB APPROVAL**LIBERTY UNIVERSITY.**
INSTITUTIONAL REVIEW BOARD

May 9, 2017

Paula Bartolo

IRB Approval 2865.050917: Integrating Google Apps and Google Chromebooks into the Core Curriculum: A Phenomenological Study of the Lived Experience of Public School Teachers

Dear Paula Bartolo,

We are pleased to inform you that your study has been approved by the Liberty University IRB. This approval is extended to you for one year from the date provided above with your protocol number. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

G. Michele Baker, MA, CIP

Administrative Chair of Institutional Research

The Graduate School

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APPENDIX G: SAMPLE TRANSCRIPT WITH BRACKETING

070521_0932 Transcript

15 min 26 Sec.

Date: 05-22-17

Time: 09:32

I=Interviewer P=Participant

(Interview Start)

Q1. What has your experience been using Google Suite for Education with Chromebooks in the classroom?

P: Well this year we have done a concerted effort to try in our improve our using um Google um Classroom and I've found it has been a big help. Um, usually post videos, study guides, review worksheets, and classroom or links to other um websites that students can use to practice and review for um whatever particular unit in math that we're working on. [I use Google Classroom with my students to post interactive documents, template, instruction, and assignments. It works well for me because I can now look at their work at home on my phone and not have to stay at school to correct their work from the server or save their work to a flash drive that was so time consuming]

Q2. What factors have impacted your use in integrating Google Suite for Education with Chromebooks in the classroom?

P: Ummm, I think the reason why we decided to because most of the kids are quite tech savvy and we feel that we should utilize the um technology that they are used to um and also to get them prepared for the 21st century you know career and learning goals that are now embedded into um common Common Core. [In my knowledge of standards and Common Core there is a greater emphasis on using technology to produce projects]

Q3. Please describe your first impression about G Suite for Education with Chromebooks when it was first introduced to the district.

P: When it was first introduced um we didn't really get any training or even any "hey this is great you should try using this". So it did take me awhile at least over a year to really get into using it. Um, and a lot of that was due to the efforts of ----- herself. Um, because she came into our classrooms and she utilized it as I kept seeing um how easy it was, I'm like "oh I really need to do this" so now we do. [in my experience having someone show you can be helpful]

Q4. Please describe how you felt about GSFE with Chromebooks after integrating it into your curriculum for the first time.

P: The first time again I thought oh this looks really difficult, but again as I used it and saw other people use it, it it's quite easy to maneuver through the site um, I haven't yet to have a link that didn't work um so it's pretty easy to copy and paste. [at first I was nervous about the sharing piece but after I understood that it was private until shared I felt comfortable] It's right now it's a great way to reach out to parents if they want to get onto their students' Google Classroom [I use classroom and it makes it easier for posting lessons and rubrics].

Q5. How long have you been using Google Suite with Chromebooks in your classroom?

P: I'm going to say that this is probably the second year with the first one me not really using it a lot and again this year it has definitely increased in usage. [I learned on my own how to use it and then I attended some workshops that reinforced what I learned]

Q5.a. How do you feel now about GSFE with Chromebooks after using it over time?

P: I think they are a great tool! Students like coming to class to use them and it allows me to post more information for them to use to practice and review math. I plan on using more next year than this year. I did not use it a lot in the beginning of the year but now for each unit of

study since January I have posted study guides, practice materials including games and self-check quizzes, and videos for students to use to enhance their learning and have them more accountable for their learning. [I have worked with students on the Chromebooks and they were excited to use them and on task]

Q5.b. What attitudes or personal perceptions have changed since you have used it over time?

P: Again as I said earlier I thought, I think its uh a really easy site to use. Um I also discovered some of the add-ons that you can use too. We've been kinda researching them and it does take a lot of time it is time consuming to research which one will work for you and which ones won't. Um but uh I did we did add on the uh one of the math ones that utilizes...um...symbols and so we can create equations and stuff. [As I used it I have ventured out into add-ons myself to see what works well with the existing apps]

Q6. What applications in G Suite for Education do you use with your students?

P: Ah Google Docs, Google Sheets, um Google Classroom, those are probably the three major ones. We also do the PowerPoint slides; the Google Slides also. Um it is a great way for them to collaborate with one another ah and to share it out with me so there is less paperwork. Google Forms too I forgot I used that once too. [I use Classroom, Drive, Docs, and Slides. I have had classes use Draw and add-ons such as EasyBib]

Q7. How has G Suite for Education impacted your teaching?

P: Well I think it's um again a great tool to use with the students. Um to introduce and to make them use technology on a, at least a weekly basis. Um I also think it's a great way to make them more responsible for their own learning cause the sites are there um when they log in there are links that they can go to um and study guides and other videos that they can watch so that if okay

I don't understand something then they need to learn to take the initiative to um...enhance their own learning. [I see it enhances collaboration for me personally]

Q8. How did you change your delivery of the content when integrating Google Suite for education?

P: I'm not really sure we've changed the content I think we've enhanced it...um again by putting up links to websites, to videos, to games, they love to play math games. Um I think its enhanced um content delivery. Um I also think by using slides, or sheets, or Google Docs with them it again it enhances the curriculum content that that they can see. Um and also it allows them to elaborate (rephrase) collaborate more with one another too. [I agree the content gets enhanced it helps with differentiating in that before it may have been paper instructions and now it's a presentation or links to other websites]

Q9. How did you change your student assessment of the content when integrating G Suite for Education?

P: Um, I'm not sure we've changed the assessment approach...I mean we still do test and quizzes the old fashion way on paper. Um I did do a quiz through Google Forms once and I have done links to other sites that provide quizzes like Quizizz through Google Classroom which we have counted as quizzes. So we're getting there, It's probably one of uh something that we're working towards being able to um you know use more assessment pieces with it. [I think they need regular access to the device in order for their assessments to change. I think this would have to be planned into a lesson when a teacher has the Chromebooks.]

Q10. Please describe the type of learning activities students participated in using G Suite for Education.

P: Yeah, so we've used Google Slides where they have had to do presentations um... perhaps maybe create a vocabulary book for math. We have used Google Classroom where we uploaded review sheets, study guides, links to other sites that would include videos: Kahn Academy, Math Playground, um where and we focus on a particular unit that we're studying. Um, so Quia is another site that we've had links to um and all of these are provided for the students to review and to um enhance their learning. [I've used Docs, Slides, and classroom the most to collaborate on research and present the research using Slides collaboratively editing the documents]

Q11. Have you found any changes in student learning using Google Suite for Education?

P: Well one of things I think has changed is making them more accountable... for their own learning um because when you post all of these study guides, websites, links, videos for them to review and practice it really is on them. Um some students do take advantage of it some don't. It's still a work in progress so we'll kinda take a look at it again at the end of the year and kinda say okay this worked this didn't work um again try to improve each year. [I think it enhances their learning]

Q12. Please describe how G Suite for Education with Chromebooks works with your subject's frameworks and Common Core Standards.

P: It works great um again as I previously stated um...being able to provide links for the students to you know watch a video to reinforce or to review a concept um or a link to a game, they love being able to play games. Uh one particular game that we just did was a basketball game and I think they maybe focus a little too much on playing the game but that's okay cause a lot of times they don't see math as fun and I think this is one of the ways that we can um show them--hey you know what you can play games and learn math at the same time. [My personal standards have collaboration built in so the sharing tool works great meeting this standard]

Q13. How do you perceive the use of Chromebooks in your classroom?

P: Um, I think it's a great tool, um we do still have issues with connectivity but that's not the Chromebooks fault um or Google's fault um. But, I think they do enjoy coming into the class knowing that they are going to use them rather than sitting and listening to me or uh doing a worksheet or playing or doing a round robin. So I think ah they do look forward to using the Chromebooks. [When I have used the Chromebooks with students they were engaged]

Q 14. Please describe how students used the Chromebooks in your classroom.

P: Uh, well again we use Google Classroom links are provided to other websites to websites like: Kahn Academy, um Virtual Nerd, um Math Playground, um Quia, as well as our online textbook. We also provide links to that where they have self check quizzes um or perhaps I might post a reteach worksheet for them to print out at home if they so choose. Um we've used it for students to collaborate using Google Slides or Google Documents where they work with one another um and we've also used Google Forms to um do a quiz once. [Students first have to login and the very first time they do this can be very time consuming getting them in and then after that each time becomes easier. I've shared interactive worksheets where they go in and share it with their group and work on it to do research]

Q15. Please describe how students perceive the use of Chromebooks in your classroom.

P: Oh I think they it's wonderful. Um I think again it's bringing some um...new love for math to some because they realize Oh, that I can even use Chromebooks on a on a computer and I think that's important for them to see that um math isn't just on a piece of paper. [I've never heard a student complain about using the Chromebooks]

Q16. Please describe any professional development you have received using GSFE and Chromebooks.

P: Other than learning it on my own we haven't (laugh). Um I think maybe once a long time ago when they gave us our username and login, they said, "oh you might want to check into this", but um there's been really no official...training other than um what we've shared; what ----- has shared with us. ----- been a great resource to learning that. [Fellow colleagues sharing what they are doing can be helpful to adopt into one's own classroom]

Q17. How do you perceive professional development and support for using GSFE with Chromebooks?

P: I definitely think it's something that needs to be looked into. I do believe they have offered it as a class um when we do have professional development here. Unfortunately um it's an elective that I have not been able to do because we have other classes that we are required to take. Um so it becomes really kind of difficult to do that. [The workshops I have attended I have found that I have taken away the most was when I could relate it to my own lessons and saw student projects]

Q18. What technical issues have you encountered when using the Chromebooks?

P: Other than connectivity? Um none.

I: What do you mean by connectivity?

P: Oh, getting onto the Internet.

Q19. What would you suggest to school systems looking to implement GSFE with Chromebooks?

P: I think if you want to go um a 100% forward I think you need to show uh your staff the um pros and cons of the site. I think you need to also show them um how they can use it in their own

classroom not in a general sense. I think it's a lot easier for folks to say, "oh you mean I can post a... I can write a quiz on here", um rather than just saying okay well here you can use Google Forms to do this but you don't show them you know exactly how it would fit into their grade level and I think that's uh probably an important piece. [Staff training is an important.]

Q20: What suggestions do you have for colleagues interested in integrating GSFE with Chromebooks?

P: Use each other as resources I know that my first try at Google Forms was because someone else told me, "oh yeah we just did a quiz on it and graded it and everything" and I was like, oh really? Um, so I did try it once I know I have to work on it a little bit more, I think that will probably be looked at next year because the little quick little thing that I did was oh this is really easy um but I think you need to rely on each other and share information. [I would suggest take trainings when offered and reach out to a peer and ask them for help or ideas]

(Interview end 15m 26s)

APPENDIX H: EXAMPLE OF THEME WITH SIGNIFICANT STATEMENTS

Theme 2: Chromebook Accessibility and Connection

Participant	Significant Statement
Aiden	<ul style="list-style-type: none"> • I definitely think they need to consider how many Chromebooks they should buy. • If it's feasible you know really having students get their own. • Just lack of Internet connection has been a major one. • Um sometimes we don't know when the Internet is going to work or not, that can be frustrating especially when you have a a class period where you planned an entire Chromebook lesson. • I was going to say lack of Internet connection (laugh). • It's consistent, Internet connection (laugh) that's the biggest roadblock I think. • So better Wi-Fi infrastructure would be helpful
Amanda	<ul style="list-style-type: none"> • Ah Chromebooks to be honest, I think the biggest obstacle I've had is getting access to them cause we only have two carts in the building and they've become quite popular so getting access to them has been difficult. • One time the Wi-Fi was down (laugh) when I went to use the Chromebooks. • Um it was working in the beginning of the day so you know, I had the the whole day signed out and then by the end, in the afternoon the

	<p>um Wi-Fi was down and so therefore and my assignment was all you know internet-based.</p>
Ann	<ul style="list-style-type: none"> • Our connection on this end of the building is poor and some days it works well and other days it doesn't. • Um, I still have positive ideas about the Google product it's our network that I have issues with. • So it's positive as long as the network works (laugh). • The only thing I've had to deal with that stressed me was the uh network. • Make sure the wireless network is sufficient for the amount the number of tablets they are using.
Beth	<ul style="list-style-type: none"> • So that's a big factor because sometimes I might have a plan but then if I look at the master sheet and there's no Chromebooks available I have to revamp my plan or even move my lessons around so that's always something I have to take into consideration. • Um occasionally of course there are issues with Internet access. • Like they'll be on they'll be running and then it will say loading and it just keeps loading...I think that's an Internet problem, I don't think it's a Chromebook problem.
Catherine	<ul style="list-style-type: none"> • Um...I would really like to be able to have them all the time. • The only time we had it was um a little bit when fourth grade took --- --- (state test) and Um then we had a little trouble with the kids

	<p>getting who had gotten the password but um that seem to have been fixed.</p>
Cynthia	<ul style="list-style-type: none"> • I would like to have access more frequently than I do. • Wi-Fi connection that's the main factor. • Somedays I have no Wi-Fi connection, some days I have half the room with Wi-Fi, so we all sit on one side of the room. • Wi-Fi is the issues that we typically encounter. • Lack and difficulty connecting, the Chromebook tries to connect to the neighbor's wireless.
Deb	<ul style="list-style-type: none"> • Um, access to the Chromebooks we don't have them all the time so w-we share three carts amongst our team. • Um so we unfortunately can't use them everyday so there has to be some planning there. • I think even the availability of the Chromebooks. • Um sometimes connection problems. • Um the Wi-Fi sometimes it just doesn't work or it's asking for a password or so that can be very frustrating. • And also um if ----- (state test) we're told we can't use the Chromebooks because there is limited I guess Wi-Fi access yeah.
Jan	<ul style="list-style-type: none"> • And access to the Chromebook cart even if you could get it for some of the day like generally around here last period is a killer if you want something last period good luck.

	<ul style="list-style-type: none"> • I find it frustrating, um find that people don't take care of them, so you know they're not reliable all the time, um and you get them in a mess you put them back nice and you get them in a mess again. • I had one day where I was correcting some stuff and I actually had the phone set up to be a hotspot because there was no Wi-Fi. • In the past the Wi-Fi was the question logging in and it would log the kids off randomly in the middle of nowhere.
Karen	<ul style="list-style-type: none"> • If I could have a cart all day I'd take it (laugh). • No (laugh) Wi-Fi that's the biggest problem. • Lack of connection, um carts not being plugged in properly that's a biggy, that's it.
Kim	<ul style="list-style-type: none"> • Um for the kids and I can't get, there's not enough Chromebooks um and it's frustrating you know. • Well the first one clearly from the last answer is availability. • I wish I had Chromebooks in my classroom. • I wish I had access...daily or or say team wise you know the team had a set so that I could plan ahead. • If I spent days developing an entirely new lesson that needs to be in the next week or so because of you know that's the way my curriculum falls and I can't get them, I've just spent all that time and done nothing.

Pam	<ul style="list-style-type: none"> • Well I would like our school system to put more money into it because my kids they have it so that every kid has one and they come in and they return it at the end of the day. • My biggest issue is my Wi-Fi which has nothing to do with Google it's my, I'm in a dead zone. • So I've been using the cart but in the library because every time we try to use it, I'm ready to throw it out the window (laugh) because my Wi-Fi cause they'll say yeah you have it I'll get the cart no we don't know I don't. • And like I said, honestly if I didn't have Wi-Fi issues I would probably love love love love love it but it's not it's not its fault (Laugh). • Um so like I said I love it when I have Wi-Fi (laugh) but when my Wi-Fi doesn't work it's um it can be frustrating because now I've planned a whole lesson around this time block.
Ruth	<ul style="list-style-type: none"> • The only negative perhaps might be the um the amount of use that our school system has um provided for, however I believe that they've remedied that issue. • Sure, because the Wi-Fi will go down spontaneously from time to time without any rhyme or reason. So, that's been the only issue.
Sue	<ul style="list-style-type: none"> • Um, I think it's a great tool, um we do still have issues with connectivity but that's not the Chromebooks fault um or Google's fault.

	<ul style="list-style-type: none">• Oh, getting onto the Internet
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APPENDIX I: EXAMPLE JOURNAL ENTRY

Beth

May 16, 2017

*I used Google Calendar to schedule use of Chromebooks. This is a fairly easy process. The only part which could be improved is that a teacher must check the master permanent schedule to make certain no other teacher is scheduled.

*A few students have rewritten essays on Google Docs from last week to improve their writing and their grades. These will be printed and turned in for regrading. Google Docs makes it easy for students to revise their work as often as necessary to get the best results.

*I used Google Docs to create a review vocabulary sheet for the students.

May 17, 2017

*I used the Google Calendar to schedule the use of Chromebooks. I will use the Nearpod site to introduce the unit on folktales.

*I edited a comprehension test previously stored in Google Docs.

May 18, 2017

*Used Google Calendar to reserve Chromebooks/Labs.

*Students worked with partners to create a slide presentation in Google Slides about the major causes of the "Titanic" disaster. We reviewed the major causes as a class. Students were assigned a partner using their Punctuation Partner sheets. One student was instructed to be the "driver" and begin a Google Slide. The student then shared the new slide presentation with his partner. Students had to decide which causes they felt were the most important to include in the slide show. They were instructed to include a title slide and at least three slides for causes. These slides must have subtitles, a picture, and facts from our book or internet research. Students were instructed to add a bibliography slide to cite sources. Students worked very well together, asking each other questions about the topic and how to work the program. This was a very smooth lesson.

May 19, 2017

*Students continued their partner project on Google Slides about the causes of the "Titanic" disaster. Students shared their work with the teacher. They have done this many times so they did so without instruction. We do not use Google Classroom for this step, however, because it does not allow students to return to their work if changes or editing is required. This creates quite a challenge for me in my Google Slides account. All the classes' work is mixed together in my account!

*After two classes with the Chromebooks, I am going to relocate to the computer lab as there are not enough functioning Chromebooks in the cart for my largest class of 28.