2018

A Program Evaluation of the One-To-One Chromebook Initiative in a Rural School District in Virginia

Juvenal Enrique Abrego-Meneses
College of William and Mary - School of Education, jeabregomenes@gmail.com

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A PROGRAM EVALUATION OF THE ONE-TO-ONE CHROMEBOOK INITIATIVE
IN A RURAL SCHOOL DISTRICT IN VIRGINIA

A Dissertation

Presented to

The Faculty of the School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

By

Juvenal Enrique Abrego-Meneses
A PROGRAM EVALUATION OF THE ONE-TO-ONE COMPUTER INITIATIVE IN A RURAL SCHOOL DISTRICT IN VIRGINIA

By

Juvenal Enrique Abrego-Meneses

Approved November 5, 2018 by

Megan Tschannen-Moran, PhD
Chairperson of Doctoral Committee

Margaret Constantino, PhD
Committee Member

Jennifer Parish, Ed.D.
Committee Member
Dedication

I dedicate this dissertation to my mother, Marizenia Meneses and my grandparents, Maria and Onesimo for giving me the gift of determination and hardwork.

To my best friend and partner, Johnathan Crawford, for inspiring me to stay strong, positive and focused on my goals and career. To my dearest friend, Susan Weinberg, for dedicating her time and patience making sure that I believe in myself through this time of endurance. To my dogs, Diego, Dora, Dilan and Lucile, for keeping me company during long nights and early mornings of work. Finally, to all my friends and mentors, who have been cheerleaders throughout the completion of this program.
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Abstract

The purpose of this program evaluation was to evaluate the implementation of the One-to-one Chromebook initiative in a rural school district in Virginia. The study used the goals of the district’s technology plan as a framework to measure the effectiveness in the implementation of the One-to-one Chromebook Computer initiative in Grades 5, 6, 9, and 10. The study sought to collect the perceptions of stakeholders toward the program, the degree to which students engaged in the purposeful and effective use of Chromebooks as well as the application of technology to demonstrate students’ knowledge of 21st century skills. The participants included school administrators, students, teachers and parents of students in Grades 5, 6, 9 and 10. This evaluation used a mixed method approach for the collection of data. The logic model served as framework to understand the inputs, activities, outputs and outcomes of the program. The findings revealed that there is a need to reevaluate certain aspects of the program, including the goals of the initiative in relation to specific parameters to delineate the use of the Chromebooks in classroom. Additionally, teachers and students need more training to become more comfortable with the tools that the device offers for instructional purposes. Two of the recommendations that emerged from the findings and conclusions are the creation of a new technology integration team and the use of SMART goals for teachers to plan strategically how to integrate technology in their lessons. This evaluation also suggests the construction of new goals to provide the division with new perspectives on how to continue the initiative, so that it advances from its current technology integration level to higher levels in order to foster students’ desire to use devices such as Chromebooks to become part of a technologically inclined world.
A PROGRAM EVALUATION OF THE ONE-TO-ONE CHROMEBOOK INITIATIVE
IN A RURAL HIGH SCHOOL IN VIRGINIA
CHAPTER 1

Introduction

Background

The beginning of the 21st century marked a revolutionary era in the field of education as it challenged school systems to prepare students for a competitive world in which technological advances and critical thinking became the center of innovation. Blair (2012) stated,

With the world literally at their fingertips, today’s students need teachers and administrators to re-envision the role of technology in the classroom…the new 21st century learners must master more than the core curriculum to succeed in secondary and postsecondary institutions as well as the workplace. (p. 9)

To meet the demands of a forever-changing world, U.S. public schools have gradually aligned resources and curriculum frameworks to establish a position as technologically inclined centers of learning, so that every student has an opportunity to experience emerging trends in instruction and technology.

Although many U.S. Public Schools have achieved great success integrating technology in their classrooms; there are still many others struggling to meet the technology needs of students due to fiscal, geographical and human factors that limit a school district’s ability to maximize the teaching and learning process through technology integration. According to the 2018 Broadband Deployment Report from the Federal Communications Commission, there are approximately 14 million Americans in rural communities who are unable to obtain internet service. A reliable network or ability
to use upgraded internet services sometimes become a luxury for school systems, forcing students and teachers to continue using traditional approaches to teaching and learning.

Additionally, a report conducted by the U.S. Department of Education in 2008 concluded that rural districts are more likely to experience a lack in technology leadership because they might not find people with the necessary IT skills to lead a robust school district network that would afford the district innovative educational opportunities (Gordon, 2011, p. 20). The Summerville County Public School system, a rural school district in Virginia, is no exception to these issues. Within the county, there are multiple residences without internet access due their rural location; as a result, students often rely on time at school to access technology. Students attending Summerville Middle and High Schools have access to two computer labs, which are only accessible through reservations made by their teachers. Moreover, technology and innovations are planned under financial conditions that sometimes end up pushing technology initiatives aside.

**Virginia Educational Technology Plan.** In 2003, the Virginia Department of Education (VDOE) introduced an Educational Technology Plan that outlined the importance of knowledge-based learning and the development of cutting-edge technology skills to enter the workforce as part of the Virginia high school graduate profile. Data included in the document asserted that:

Eighty-five percent of schools in Virginia report that many of their teachers use computers for planning or instruction. Also, 75 percent of schools in Virginia report that most of their teachers use the Internet for instruction. However, there is little information about how effectively teachers integrate the use of the Internet into instruction. In fact, *Technology Counts 2002* also indicated that lower-level
applications of technology for instruction, such as drill-and-practice applications, were most often found in Virginia schools. (p. 10)

According to the VDOE Educational Technology Plan document, the General Assembly and the Governor allocated 326 million dollars to support the implementation of the plan in Virginia public schools. The Virginia Educational Technology Plan emphasized the following elements of learning:

- Use of technological tools by teachers in classrooms to promote students’ engagement in and outside of the classroom.
- Effective and well-structured technology plan supported by five important components: professional development, connectivity, educational applications, and accountability.

Today, the vast majority of school districts in Virginia have developed their own Technology Plans, demonstrating both their commitment to providing students with an avant-garde academic preparation, and excellence in teaching and learning. Both federal and state educational agencies have served as the catalyst for school districts to exploit their resources to enhance the quality of instruction in public school classrooms by integrating curriculum frameworks and methodological approaches.

Additionally, school systems have prioritized the importance of providing high school students with adequate knowledge and proficiency in the use of various technological devices, software, web applications, and/or online educational programs, so that they can successfully employ these skills to enter the workforce or in the context of higher education programs. Many states have made it mandatory for educators to seek training, in order to meet technology requirements that will make them eligible to obtain or to renew their teaching certification, outlining the need for teachers to become fully
capable of integrating technology and the use of new electronic devices in their daily lessons.

**Program Theory of Action**

Since the beginning of the 21st century, the need for more student-centered practices and individualized learning approaches has grown. Today, schools maintain a focus and a sense of urgency for instructional practices that promote meaningful learning and productive learning environments where teachers assume the role of facilitators. The world is currently dominated by the ongoing production of new technological devices. Technology influences the way teaching and learning is conducted in classrooms. Schools are constantly seeking to innovate. Innovation demands active classrooms where students’ needs are met in accordance with their skills. The use of technology may awaken students’ interest in the learning process, which will improve the quality and effectiveness of the teaching process.

A. M. O’Donnell (2012) indicated, “At the heart of most cognitive approaches to understanding learning is the notion that knowledge is constructed by the learner and informed and influenced by the learner’s previous experiences.” (p. 61). One-to-one computing initiatives align with the premise that learners should have the opportunity to discover concepts and ideas on their own, employing multiple skills; assimilating and adapting to new practices that give them more control over their learning and their experiences at school thus One-to-one computing initiatives set the ground for this new trend in schools.

Incorporating technology in schools gives students the opportunity to explore multiple modalities that can put them in control of their own learning, resources and time to obtain new knowledge. The information processing view represents a recent
application of Piaget’s theory in instruction because it underlines the importance of knowledge through senses and actions, involving learners in meaningful activities to retain information (Mayer, 2012, p. 85).

One-to-one computing programs in schools stimulate students’ desire to become part of a technologically inclined world. Integrating technology can be a difficult task when there is a lack of tools and motivating factors for teachers and learners to emulate desired practices. Providing teachers and students with tools to enrich learning experiences in the classroom is paramount as school districts contend to improve instructional practices, student engagement, and academic performance at all levels. One-to-one computing initiatives can balance both innovation and the enhancement of instruction by giving teachers and learners a tool to explore additional learning opportunities in various ways: Virtual experiences, availability of resources at home, additional practice on computers and many other forms of instruction that are accessible online.

Therefore, this study examined how implementing the One-to-one Chromebook Initiative at the middle and high school levels supported the goals of the Summerville County Public School District’s Technology Plan to engage students in meaningful curricular content through the purposeful and effective use of technology and Afford students with opportunities to apply technology effectively to gain knowledge, develop skills, and create and distribute artifacts that reflect their understandings.

**Context for the Study**

The Summerville County Public School District (pseudonym) is a small rural school system in Virginia. It enrolls about 1800 students. The school district educates children starting in pre-kindergarten through grade twelve. All schools in the district are
fully accredited. Three schools are part of the district: SC Elementary (PK – 4), SC Middle (5-8), SC High (9-12). The school system spends 66% of its budget on per pupil expenditures. According to the District’s 2016-2017 report card, the school system had an on-time graduation rate of 93.5%. In the class of 2017, 51% of students received a standard diploma, 43% obtained an advanced diploma and 6% of students dropped out.

The district’s superintendent, the directors of Personnel and Instruction, School Operations and Pupil services make up the school system’s leadership team. An instructional technology resource teacher, three technology specialists, and a data manager oversee the technology department, which coordinates all technology activities for the three schools. Each of the three schools operates under the supervision of a principal and an assistant principal. Approximately 125 teachers are employed by this district.

**Description of the program.** The vision of the school system’s technology plan indicates that all students, teachers and staff will be equipped with access to the current and emerging technologies needed for the school system to sustain avantgarde instructional effectiveness. As highlighted in the vision of the technology plan, the school system seeks to improve academic performance by optimizing the use of technology in classrooms, by providing every student with a Chromebook laptop computer that will hopefully awaken students’ interest in various topics, access to information in school or at home, and opportunities for students to develop the necessary skills to compete in a global society.

The Summerville County Public Schools’ technology plan set forth various goals, initiatives and programs in its 2015-2018 Addendum. The district’s plan is guided by its academic theme and core value, “Raising the bar.” The plan includes five major goals
and their objectives, which will afford the district a chance to provide students with additional opportunities to grow and enjoy learning. The five goals and their respective objectives are:

1. Provide a safe, flexible and effective learning environment:
   Objectives: Provide technical and human infrastructure to support formal and informal learning environments and develop policies and procedures to acquire and manage new technologies.

2. Engage students in meaningful curricular content through the purposeful and effective use of technology.
   Objective: Deliver technology-enhanced curriculum and resources to support personalized learning for all students.

3. Afford students with opportunities to apply technology effectively to gain knowledge, develop skills, and create and distribute artifacts that reflect their understandings.
   Objective: Encourage creativity, collaboration, and problem solving.

4. Provide students with access to authentic and appropriate tools to gain knowledge, develop skills, extend capabilities, and create and disseminate artifacts that demonstrate their understandings.
   Objective: Ensure that every student has access to personal computing device for students and assist educations in the selection of authentic and appropriate tools for grade levels and curricular areas.

5. Use technology to support a culture of data-driven decision-making that relies upon data to evaluate and improve teaching and learning.
   Objective: Collect data to support technical, pedagogical, and financial decisions.
Summerville County Public Schools’ technology plan. After an evaluation of the accomplishments made through the implementation of the Summerville County Public School District’s 2010-2015 technology plan, the school system created an addendum to the current technology plan highlighting the district’s new goals, initiatives and pilot programs to mark the school system’s efforts to evolve along with new technology trends. The new initiatives and pilot programs in the 2015-2018 plan include:

- One-to-one computer initiative: Students in Grades 5 and 9 have access to Chromebook computers in schools and for use at home.
- Bring Your Own Device policy: Students can bring their personal devices (cellphones, tables and laptops) into the classrooms for instructional purposes.
- Microsoft 365 Student Free Version: Students are able install applications for their use in school and at home.
- Blended Learning: Incorporation of blended learning models, integrating face-to-face classroom with online platforms.
- Flipped Classrooms: Teachers employ this strategy to reverse the traditional instructional approaches to enhance classroom instruction.

Among all the initiatives included in the district’s technology plan; the One-to-one Chromebook computing program seemed to be the most ambitious because it involves major financial, operational, and instructional enhancements that could influence the successful implementation of the program. Having access to a personal computing device has afforded Summerville County Public School students some opportunities to learn through technology, regardless of their access to internet at home, making learning more meaningful to students in the middle and high school levels. Moreover, this program has placed the school division ahead of other school systems in
the surrounding area. During the last two school years, the school division has remained fully accredited, and they have made great progress in helping students achieve academic goals through virtual programs such as Virtual Virginia.

According to the 2015-2018 addendum, the school district’s technology plan followed the SAMR Model of technology integration (Substitution, Argumentation, Modification and Redefinition). See Figure 1, description of the SAMR Model.


Additionally, the technology plan adhered to the International Society for Technology in Education’s standards, which describe how students and teachers can reach various levels of proficiency in accordance with 21st century skills. See Appendix A. Effective November 2015, all students at the middle and high school levels were
allowed to bring their own technology devices into classrooms for instructional purposes. The Bring Your Own Device initiative was rolled out as an attempt to provide teachers and students with an opportunity to become more comfortable with the use of technology.

In a three-year expansion, the Summerville County Public Schools system planned to provide students in the middle and high school levels with access to Chromebook computers, to use in school and at home. The district’s technology plan did not include a statement to indicate their decision to purchase Chromebooks instead of other computing devices. During the 2016-2017, Summerville County Public Schools rolled out the One-to-one Chromebook initiative, which has since then added new grade levels, making Chromebook computers available to students in Grades 5, 6, 9, and 10. Each student must pay $35 to insure the device at the beginning of the school year. For students who could not pay for the insurance fee, but could demonstrate free and reduced lunch status were issued Chromebook computers, the insurance fee was waived.

The district approved $550,733 in their budget to improve the use of technology in schools, and to reach Goal 4 of the revised technology plan, which indicated that all students were going to be given access to a computing device. To promote the adequate use and care of the computing devices, the district will grant every student, who has been issued a Chromebook computer, the opportunity to keep the device once they have completed their senior year.

**Purpose of the Evaluation**

The purpose of this evaluation was to assess the value of the implementation of the One-to-one Chromebook initiative as it pertains to the use of technology and student engagement in the teaching and learning process at the middle and high school levels. This formative evaluation considered the implementation stages of the Chromebook
initiative in relation to the goals of the district’s 2015-2018 addendum to the technology plan, to examine the factors that influence the success or failure of the program in this school district.

Since this program was in its second year of implementation, and it was being piloted only in Grades 5, 6, 9 and 10; the evaluation may serve to propose changes based on the concerns that arise or build upon current practices as the initiative is expanded to other grade levels. Because the program will be reaching its full implementation cycle, this evaluation is timely as the findings will provide the district’s technology team with information that they can use to improve the use of the Chromebook device for instructional purposes, and it can also inform the leadership practices in how to roll out cost-effective initiatives that promote the success of all students.

**One-to-one Program Logic Model**

Mertens and Wilson (2012) define logic models as follows, “A model that displays the sequence of actions in a program, describes what the program is and will do, and describes how investments will be linked to results” (p. 560). The logic model presented in this evaluation identified the inputs, activities, outputs, and outcomes of the One-to-one Chromebook initiative as it pertains to the implementation of the program. See Figure 2, Program Logic Model. Because this program was in its second year of implementation, it was too early to determine the impact of the program as whole in this evaluation; however, there were specific short-term and long-term goals that were used to determine whether the implementation stages of the program revealed a change in the practices, and the development of skills among students and teachers, resulting from the One-to-one Chromebook Initiative.
**Input.** The Chromebook computer program manifests the desire of the district’s leaders to innovate and expand upon resources to optimize instruction, which ultimately reinforces the state’s stake on preparing students for postsecondary educational goals. The plan is directly executed by teachers. Ongoing training and funding are imperative in order to obtain desired outcomes. Teachers will make resources accessible online, which will give them an opportunity to become more involved in the learning process.

**Activities.** The spiral cycle of implementation in a three-year expansion allows for distractions that could potentially hinder the goals of the program. This type of program requires continuous sustainability of the momentum. In other words, the district must secure adequate funding and provide teachers and students with ongoing opportunities to update their knowledge as new applications and equipment emerge. The school board and district superintendent must evaluate fiscal and human resources to extend and maintain the initiative efficiently in the district.

**Outputs.** An effective implementation of the program can consistently minimize negative factors impacting teacher and student performance; which results in accomplishing short-term and long-term goals to create a platform of everlasting instructional and professional quality for the school system. Additionally, the goals mirror the district’s vision to improve academic success, and to bring about change in what the school system does to prepare students to face the challenges of a forever-changing world, where postsecondary education has become a requirement to enter the workforce.

**Outcomes.** The outcomes have the potential to develop a solid foundation for success based on innovative educational practices. The outcomes of the One-to-one Chromebook initiative are directly influenced by the outputs, as the program consists of a
cyclical progression to sustain continuous improvement and to achieve desired goals. The outcomes measure the district’s ability to sustain their initiatives through the adequate utilization of fiscal and human resources.

<table>
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<tr>
<th>Inputs</th>
<th>Activities</th>
<th>Outputs</th>
<th>Outcomes</th>
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<tr>
<td>Budget</td>
<td>Purchase Chromebook computers for each student in grades 5, 6, 9 and 10. Update internet services to support the effective use of personal computing devices in all schools.</td>
<td>Chromebooks for all students in Grades 5, 6, 9, and 10.</td>
<td>Short-Term</td>
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<td>Teachers</td>
<td>Participate in training and PDs to gain skills and knowledge in the use of Chromebooks for instructional purposes. Incorporate the use of Chromebooks in the teaching and learning process.</td>
<td>At least 25% of Lessons are delivered using Chromebooks.</td>
<td>The use of technology increases.</td>
</tr>
<tr>
<td>Chromebooks</td>
<td>Provide students in grades 5, 6, 9 and 10 with Chromebooks to develop their 21st century technology skills. Students and teachers gain the knowledge to use Chromebooks in the real world.</td>
<td>At least 50% of teaching and learning resources for a class are available online.</td>
<td>Students’ engagement improves.</td>
</tr>
<tr>
<td>Technology Committee</td>
<td>Create policies to incorporate adequately the use of Chromebooks in the teaching and learning process. Plan and evaluate the implementation of the One-to-one Chromebook initiative.</td>
<td>At least 25% of Student Performance Activities and assessments are completed using Chromebooks.</td>
<td>Discipline problems decrease.</td>
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<td>Teacher turnover is reduced.</td>
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<td>Long-term</td>
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<td>90% of Students at SMS &amp; SHS achieve academically.</td>
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<td></td>
<td></td>
<td></td>
<td>SMS and SHS maintain fully-accredited status</td>
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*Figure 2. Logic model of the Implementation of the One-to-one Chromebook Initiative in a Rural School District in Virginia.*

**Overview of the Evaluation Approach**

The evaluation of the One-to-one Chromebook Initiative placed emphasis the first two years of implementation of the One-to-one Chromebook initiative in Grades 5, 6, 9, and 10. This evaluation was conducted under the basis of a pragmatic paradigm as its results can be used to make decisions about the effectiveness of the program to pilot similar initiatives in other schools. Qualitative and quantitative methods were used to gather the data, which determined findings, conclusions, and recommendations.

**Focus of the evaluation.** This evaluation focused on the activities and outputs of the program and their influence on the teaching and learning process in the middle and
high school levels. One-to-one computing initiatives have experienced great success and impacted academic performance in many instances. The integration of technology in the classroom has allowed teachers to reach more students, meeting the needs of various learning styles. Goodwin (2011) described some benefits of One-to-one computing in school systems, including: more engaged learners, proficiency in the use of technology, and monetary savings generated by cost effective measures by eliminating the use of textbooks and paper. Despite the many positive contributions of One-to-one initiatives in schools, there is still a need to identify the factors, which contribute toward the success or failure of One-to-one computing within a specific context.

**Evaluation questions.** The main goal of the One-to-one Chromebook Initiative at Summerville County Public Schools is to maximize the quality of instruction and students’ learning experiences to improve the school’s ability to prepare students to meet the demands of a technologically inclined world.

The questions below represented the guided principle of the evaluation as the answers to the questions were used to assess the effectiveness of the program implementation in relationship to its goals:

1. What is the perception of stakeholders regarding the implementation of the Chromebook initiative in this school district?
2. How do core instructional practices at SMS and SHS demonstrate the division’s goal to engage student in meaningful curricular content through the purposeful and effective use of technology? (Goal 2)
3. To what extent has the Chromebook initiative afforded students the opportunity to apply technology to gain knowledge, develop skills, and demonstrate understanding of technology in the 21st century? (Goal 3)
Significance of the Study

The results of this evaluation may provide school districts with similar demographics, and advocates of technology integration with information regarding the implementation of One-to-one computer initiatives at middle and high school levels in a rural school. The context of this study is of interest due to the lack of research pertaining to the implementation of One-to-one computing in rural schools. The needs of rural school districts present a challenge when it comes to the use of technology in classrooms. Such needs can contribute to the success or failure in the implementation of One-to-one computing initiatives.

Additionally, this evaluation was designed to inform the district’s school leadership team about the current practices, strengths and weaknesses of the program at the middle and high school levels. This formative assessment should serve as a measure to expand or modify the goals and implementation process of the One-to-one computing initiative in the school district. The data collected from this evaluation can be disseminated among stakeholders as a tool to reinforce the district’s commitment to transparency in their effort to enhance instructional practices. It may also be useful as the district begins to formulate its next technology plan.

Definitions of Terms

Rural schools. Characterized by their geographical location. They are usually located within an hour from metropolitan areas. Rural schools are represented by small populations and agriculture as the main source of employment.

Chromebook. A laptop, which operating system is identified as Linux-based Chrome OS. It is a Google product that performs tasks under the basic functions of Google applications and cloud storage.
**One-to-one Computing.** It is the basic instructional notion of providing students with a laptop to use in school or at home for instructional purposes.

**Value.** The usefulness and worth of the program to fulfill the educational and personal goals within a given group.

**Perception.** Stakeholder’s understanding, awareness and views regarding the educational and individual benefits of a program.

**Parental Engagement.** Parents’ participation and ability to offer input and feedback in the implementation or development of educational activities for students.

**Instructional delivery.** The methods and approaches used by teachers to deliver instruction to engage students in the learning process.

**SAMR.** Model of technology integration developed by Ruben PuenteDura (2003) that includes various actions: Substitution, Augmentation, Modification and Redefinition.

**Student Engagement.** Students are focused on a task and become active participants of the learning process.

**Technology integration.** Implementing up to date technology practices and the use of computing devices for instructional purposes.

**21st Century Skills.** The knowledge and abilities that are associated with recent advances and the newest educational trends to equip students with the skills they need to enter the workforce and to pursue postsecondary goals.

**Professional Development.** Activities that are organized to support educators, so that they can improve their teaching practices, knowledge of their subject area and skills related to the teaching field.
Summary

One-to-one computing initiatives have strong implications for the field of education because they influence the teaching and learning process. Lieberman and Miller (2000) asserted that,

The context of teaching has changed in the past two decades, and it promises to change even more dramatically in the coming century. Our democratic society is being transformed as we rapidly move toward an information society and a global economy. (p. 48)

Evaluating technology integration initiatives is imperative as school districts strengthen their efforts to maintain instructional practices that best align with ongoing technological changes in education. More importantly, One-to-one initiatives are being implemented in many school districts to bridge the achievement gap and overcome inequities within certain student populations; however, just like any other initiative or program, providing access to personal computing devices entail more than the equipment.
CHAPTER 2

Review of the Literature

This literature review compiles bibliographical data that analyze relevant information regarding One-to-one computing in a school setting. First, it discusses the evolution of One-to-one computing in schools. Secondly, this review of literature addresses the impact of leadership, social, cultural, geographical, and financial factors as it pertains to the successful implementation of One-to-one computing initiatives. Finally, findings from various studies are presented to illustrate the effect of One-to-one computing on instruction, particularly student engagement and the effective use of technology to develop 21st century skills.

Technology such as computers are changing the way communication takes place in schools, how information is accessed and presented; on the other hand, various questions remain unanswered; particularly, how programs such as the One-to-one computing initiative solidify the goals of all educational institutions, which is to provide students with opportunities to achieve goals beyond postsecondary education. Thornburg (1999) said:

It is important to understand the role schools can play in addressing inequities. America’s schools reach all young people, rich, poor, people of color, those who live in rural areas—everyone. If our schools are equipped with the modern technologies of information and communication, they can serve as resources not just to our children, but to the community at large. This expanded role of schools as community access centers also fits with the reality that we have entered an era
where lifelong learning is a necessity, not a luxury…a technology plan connected
to the redefinition of schooling is a wonderful gift for this millennium to provide
to the next. (p. 13)

School systems should not only obtain technological resources to enhance the
teaching and learning process; more importantly, they should adopt practices that denote
a sense of innovation. The implementation of One-to-one initiatives should be carefully
planned. The district must envision a program that will not only meet the needs of the
students, but also enhances teachers’ opportunities for professional growth.

The Summerville County Public School’s technology plan does not indicate why
they made the decision to purchase Chromebook computers instead of other products.
Research supports some assumptions that can be made regarding their selection.
Chromebooks require less technical supports than other computers, they increase the
teaching time because of their high reliability, they are inexpensive, and they reduce the
risks of losing information because information is stored in the cloud. Some challenges
are: Chromebooks cannot operate Windows-based applications, many of the highly-rated
educational products on the market cannot be installed on Chromebooks, Chromebooks
are highly dependent on the wireless network, which can increase the cost associated with
the purchase of this product (B. O’Donnell & Perry, 2012, pp. 16-17).

This review of the literature will provide information that is essential to
understand how One-to-one computing has gained its momentum in education, and its
role in public school classrooms. The literature will place emphasis on the aspects of
leadership that are considered when implementing One-to-one Chromebook initiatives,
and particularly, the benefits of personal computing devices to improve instructional
practices in the classroom.
One-to-one Computing

A One-to-one computing initiative is a response for innovation in systems that are either competing to stay ahead or falling behind. In his research on the implementation of One-to-one computer initiatives in various school systems in the United States, Penuel (2006) synthesized the goals of such initiatives as follows: Improvement of academic achievement through technology, an increase on equity of access to digital resources and reducing the digital divide, economic competitiveness by preparing students to meet the demands of the workforce, and finally ubiquitous access to computers, to improve the quality of instruction in schools (p. 335). Whether it is to transform current educational practices, compete with other technologically advanced institutions or improve academic performance, One-to-one computing can be an effective approach to prepare students and teachers as they face the challenges of a progressive and rapid-changing society.

School systems should consider several elements when implementing One-to-one computing programs. He stresses the need for assessing the benefits of the program while articulating realistic educational goals. He encourages weighting the option to select technology that aligns with current student usage. Also, he recommends valuing the role of the teacher, offering continuous professional development, planning for initial and ongoing technological support, and visionary administrative leadership. Finally, he proposes having clear benchmarks to evaluate the initiative and a balance for sustainability (Frazier, 2014, p. 2).

The hierarchy of implementation begins with teachers and their desire to use additional resources to enhance their instruction. While the goals of One-to-one computing programs are noble; teachers, students, and parents are the foundation of technology integration in schools. Grant, Ross, Wang, Potter, and Wilson (2004)
identified three factors that influenced the integration of technology in a school: Teacher pedagogical knowledge, technological knowledge, and a supportive culture (p. 326). Teachers’ lack of knowledge and adaptation to technology can inevitably have negative effects in the process; nevertheless, ongoing support both in the school system and at home can make or break the success of One-to-one computing.

A strong One-to-one computing program requires adequate planning, stakeholder’s buy-in, and sustainability beyond the classroom to succeed. According to Holcomb (2009), the outcomes and success of One-to-one computer initiatives can be influenced by how and when the distribution takes place, the involvement of parents in the process and students’ continuous access to computer, so that they can complete class activities at home while improving their technology skills (p. 53). Despite the growing implementation of One-to-one computing initiatives in schools; there are still many school districts all over the United States that struggle to either secure funding or the infrastructure to support this type of initiative; for this reason, school districts must create a vision that aligns with their resources and needs, so that they can sustain a successful program.

**Leadership in the Implementation of One-to-one Computing Initiatives**

There are various factors that motivate school systems to incorporate technology into operational and instructional practices. While the implementation of One-to-one computing initiatives can be costly to a school system, they can also serve as a saving measure to increase financial efficiency by offsetting other monthly operational costs. According to Bendici (2018), a school district in Chicago was able to save money and energy by eliminating the use of computer labs through the implementation of a One-to-one laptops and Chromebooks program. The energy efficiency efforts of this school
district shed light to other ways of conserving power such as less overhead lighting in classrooms and the combination of wireless access point into one single unit (p. 48). On the other hand, leadership must support the execution of a successful One-to-one computer initiative plan. One-to-one computer initiatives are a growing phenomenon in the United States, and they represent a huge financial responsibility that school districts must undertake while making a strong commitment to improving instruction in the classroom.

Integrating new technological practices in a school system requires school leaders to assume the role of technology advocates to successfully implement any type of computer related program. Courville (2011) said, “Thus, a prime condition for being an effective advocate of technology within an organization, that individual must have knowledge of existing technology and skills necessary to demonstrate and model the effective use of technology” (p. 5). One-to-one computer initiatives do not only require financial resources for their implementation, but more importantly, a cultural, social, technical, academic and administrative infrastructure that is consistent with the needs of the program as it is rolled out in a school.

The dangers of implementing a One-to-one computer initiative in a school system are not limited to monetary provisions; there are also many institutional and instructional drawbacks that can hinder the learning process and create chaos in the community as the implementation process unfolds. A well-planned One-to-one computer initiative must involve all stakeholders in the decision-making process. In his research, Grundmeyer (2014) found the following:
• Students who participated in One-to-one computer initiatives were not familiar with the goals or desired outcomes of the One-to-one computer initiative in their schools.

• Insufficient training for staff resulted in considerable amount of wasted instructional time to resolve technology issues.

• Computers became a distraction for many students caused by teachers who did not have a concrete lesson plan to support the use of technology tools in the classroom.

A well-structured technologically inclined environment must be comprised of professional, cultural, and social compromises to ensure its success. Clausen, Britten, and Ring (2008) asserted:

Careful consideration of teachers’ instructional practices and whether current practices support effective technology use by students should be the foundation for district decision-makers before jumping into One-to-one laptop initiative. The history of technology adoption in K-12 schools has demonstrated that for those who used technology it was great, but for those who didn’t, it hasn’t changed much of anything about their instructional choices. (p. 19)

The integration of technology in schools has transformed instruction. On the other hand, there are still various counterproductive factors that are present when adopting computer products, programs, and policies without a well-defined academic goal in mind. Researchers suggest,

When factoring differences between observed instructional practices and infrastructure, results resurrect a challenge to the assumption made by One-to-one advocates: Without a well-articulated and supported vision of technology
integration by teachers and administrators, adding new technologies to the school and classroom will have minimal effect on changing teachers’ instructional practices and their technology use with students. (Clausen et al., 2008, p. 19)

Because of their great instructional and financial value, One-to-one computing as well as other programs such as Bring Your Own Device must undergo rigorous scrutiny before they can become a functional part of the teaching and learning process. For this reason, good leadership must prevail to ensure that technology becomes a functional practice in schools. Teachers define the effectiveness of technology for instructional purposes. Failure to recognize the role of educators in the adoption of technology programs can be detrimental to the vision of a technology plan for a school district. M. Claro, Nussbaum, López, and Contardo (2017) argued that school leaders and teachers must communicate continuously to align their views and school policies regarding the integration of technology in the classrooms (p. 52). School leaders must disseminate data that supports the ideas behind a well-crafted vision; so that, they can empower teachers to become the driving force for students to develop the skills they need to be college and career ready.

Implementing a program or initiative involves a lot of planning, organization, and a strong leadership presence. Topper and Lancaster (2013) outlined various factors that are necessary to make the implementation of one-to one computing initiatives successful in a school system: All levels of the district’s administration must be committed to the integration of technology in the school, and the benefits of a One-to-one initiative should be the focus of financial negotiations, so that all stakeholders measure the success of the initiative on its instructional value rather than its cost. School districts must take into consideration the long-term financial commitment that comes with sustaining an effective
One-to-one computing initiative. Districts must develop a plan to assess the imitative on a continuous basis, and a focus on the development of 21st century skills.

The previously listed elements coupled with a supportive environment can demonstrate the leaders’ understanding of the program they lead. Leaders must learn to identify those factors that might diminish the positive effect of programs such as the One-to-one computing. As they reflect on their policies and practices, leaders ought to reimagine classrooms and set forth the conditions for success to preserve a culture of innovation and change in their systems. Frenzel (2018) asserted,

Administrators must provide personalized, continuous and contextualized professional development. Share examples of how other teachers are using the technology, give teachers time to play with the technology, group teachers by ability levels, and have just-in-time support time in the classroom. (p. 60)

Leadership is the key to effective technology integration programs. One-to-one computing initiatives can provide teachers and students with access to a personal computing device, but can they really transform classrooms into responsive centers of learning? School leaders must create the conditions to see the transformation that they envisioned in their plan to increase the use of technology in schools.

**One-to-one Computing in Rural Schools**

The value of technology as a mean to achieve academic success is measured against the cost of sustaining programs geared towards improving the quality of the teaching and learning process. Rural school systems are frequently impacted by financial limitations that can challenge their ability to expand upon their resources and opportunities among students, faculty, and staff. Yet, rural schools implement initiatives to remain competitive with urban and suburban schools. The context can influence how
learners choose to respond to this type of new instructional modality, thus the culture and context of a program can determine its evolution and success.

School districts are responsible for forming their academic identity and building their reputation as solid and credible institutions of learning. In a comparison of rural schools versus urban schools, Reeves and Bylund (2005) affirmed that the presence of negative effects such as school size, poverty, and/or location in a completely rural area did not determine the presence of resources, student performance, or investment variables in small rural school districts. On the contrary, such effects seemed to be more apparent in larger school systems and rural areas (p. 377). In today’s world, becoming technologically inclined centers of learning is more than an attempt to meet basic educational needs. School systems must become the primary source for students to access knowledge and skills to become part of a forever-changing world.

In a case study related to the barriers of implementation of One-to-one initiatives, a group of superintendents in rural school districts shared the belief that the financial investment in One-to-one computing initiative is cost-effective, and a good use of school funding; they all seemed more concerned about sustaining the program and maintaining professional development for staff with a focus on technology integration (Barnett, 2012, p. 109). Technology has undoubtedly influenced the operations of schools at all levels. However, there are still major areas of improvement that can hinder school districts’ efforts to maximize the use of technology in the classroom.

Research conducted by Blanchard, LePrevost, Tolin, and Gutierrez (2016) found, “Despite sustained teacher professional development that modeled and promoted reformed-based teaching, the teachers in this rural, high-poverty setting were resistant to
major changes in their instructional methods” (p. 216). All technology initiatives must be built from a strong support to teachers, and they should carry the idea of growth for all.

**One-to-one Computing and its Influence on Instruction**

The abundance of emerging technology in the world has changed the way new generations communicate and interact. Consequently, the use of technology in schools may have a positive impact on student engagement as it has the potential to awaken students’ interest, and it can also give them an opportunity to assimilate ideas in different ways. The primary goal of any program or initiative implemented in a school is to increase student performance and academic achievement. Holcomb (2009) analyzed research findings regarding One-to-one initiatives and their impact on the quality of instruction and student achievement. Such findings revealed that many One-to-one initiatives across the United States have been implemented successfully; underlining the importance of professional development, training and support as key factors to effectively utilize computers for teaching and learning.

Hamilton-Hankins (2017) completed an action research study in a second-grade language arts classroom, which found that the use of technology has a positive impact in student engagement because students were more responsive to immediate given to them upon completion of tasks, games and online programs presented information in a way that was more appealing to the students, and discipline issues were minimized as a result of the enhancement in instructional practices. Student engagement is the core aspect of instruction. Students who are disengaged are more likely to exhibit behaviors that can be counterproductive to the dynamics of a productive learning environment.

In today’s world, technological devices seem to have a huge influence on how school-age students interact and assimilate information. Ding, Xiong, and Liu (2015)
explained, “In digital learning environments, learners can decide when to learn, where to
learn and what to learn…learners can choose learning tasks and determine learning
contents, learning objectives and learning time” (p. 1367). Technology should be
employed to awaken students’ interest in fields that were not previously explored.
Technology should be incorporated in classrooms to give students ownership of their own
learning.

In a society dominated by e-mails, text messages and virtual connectivity, it is
extremely necessary to employ emerging technology to foster students’ ability to obtain
knowledge through ways that are familiar and accessible to them. Technology should be
used to enhance learning, and more importantly, to promote academic enrichment that is
geared toward developing skills rather than improving test scores. Conway and
Ambersom (2011) found that “laptop initiatives promoted students as agents in their own
learning and sought to foster a sense of responsibility from student in relation to their
own learning and to the equipment they utilized” (p. 177). Providing students with access
to personal computing devices supports the goal of all schools, which is to prepare
students to enter the workforce, and become productive members of society as they learn
to become independent thinkers.

In her study, Whiteside (2013) concluded that a large percentage of teachers
found the use of laptop computers to have a positive impact on how they delivered their
instruction. The use of technology constitutes a change in the mindset of all participants
(p. 76). Having access to a computer is no longer a privilege, but a necessity among
learners, who understand that information is now available at their fingertips.

Technological advances force teachers to renew their practices continuously. Thus, it is
important for teachers to become fully aware of how technology can influence their ability to reach their students and help them perform successfully in their classrooms.

One-to-one computing programs are the catalyst for new and creative ways to engage students in the learning process, but more importantly, they provide students with an array of possibilities to shape a bright future. Carraher (2014) contends:

While One-to-one initiatives are predominantly a drive to promote 21st century skills for our students, the impact could provide even further value for student learning through fostering academic self-efficacy and self-regulation. The enhancement of these constructs for students could yield measurable results in student achievement. Having programs, videos and other educational resources available to students 24/7 is likely to allow students to achieve greater degree of success… With virtually unlimited access to information, students have the opportunity for exponential learning opportunities. But more importantly, they may become creators and producers of new information. (p. 105)

Daily, technology is changing, and computer software and hardware are updated. While having technology awareness is today’s quintessential function of educational institutions; school systems must maintain their focus on the emotional, social and academic well-being of the population they serve. The implementation of One-to-one computing must manifest a school district’s intention to sustain a solid academic preparation for its students; hence, it must contribute to the production of well-rounded students that will be prepared to enter the workforce and succeed in postsecondary programs.

Training teachers before the implementation of a One-to-one computing initiative will set the ground for the meaningful use of technology as a tool to increase effective
instruction in classrooms. No school initiative can be successful when teachers feel unappreciated. Research points out that teachers invest a lot time and effort into the development of technology resources that can enhance instruction; however, the lack of policies to balance the work of teachers outside of the classroom can lead to the decline of technology integration and the failure of technology initiatives (Wang, 2017).

Change can be threatening to many people and technology can have an intimidating element among teachers. In their research about e-learning, Condie and Livingston (2007) reported that,

Making use of technology to support learning and teaching and using some more constructivist approaches appear to be perceived as risky strategies for some teachers and they prefer to stick with tried and tested methods, which they believe enable them to predict and control outcomes more easily. (p. 346)

While computers have essentially influenced the way we communicate, interact and obtain information, there are teachers who have remained skeptical about allowing less traditional practices to find a place in their classrooms.

Danielsen (2009) wrote,

One-to-one initiative facilitates the teacher meeting diverse learning needs of students…One-to-one initiative becomes an equalizing force when the laptops are distributed. It helps eliminate the gaps between wealthy and poor students as well as allow for all learners to be on equal footing in terms of the equipment they utilize. (p. 83)

Research conducted in two rural Southwest Missouri High Schools differed from Danielsen’s premise as the results of the study revealed that One-to-one computing
initiatives had no impact on the academic performance, dropout rate or average daily attendance of students, particularly in the subgroups (Rockwell, 2015, pp. 65-93).

While the use of technology can optimize classroom instruction; it is imperative for all stakeholders to view technology integration programs such as the One-to-one computing initiative as a tool to enhance the teaching and learning process, as there might be a strong possibility that not all academic successes will be attributed to having access to a personal computing device. Johnson-Smith (2014) underlined that practices such as being present in class, taking and reviewing notes, personal interest toward the course and doing work outside the class were the most important predictors of student engagement, followed by the use of technology (p. 91). It would not be fair to measure the success of One-to-one computing programs on the basis of student performance. However, it is important to highlight that without quality technology programs in schools, teachers, and students will fall behind in a world revolutionized by technology.

**Summary**

Carr and Gibbs (2012) argued that One-to-one initiatives such as the use of iPads for interventions in mathematics did not have significant contributions to the learner’s academic performance (p. 85), The context of a program or the selection of the appropriate device are factors that can influence the implementation of One-to-one computing programs, and consequently its success. Despite the many instructional benefits that One-to-one computing initiatives may have, its success relies on the leaders of the school system, stakeholders, and a strong culture of innovation that permeates in the day to day operation of the system.

The literature reviewed in this chapter acknowledged the many potential positive aspects of One-to-one computing initiatives both for teachers and learners. It also outlines
the potential barriers that a school district may face throughout the various stages of the program. More importantly, it highlights the importance of enforcing policies, procedures, and assessment measures that will demonstrate a collective effort to maintain adequate resources for the success of the initiative.

It is paramount for school systems seeking to implement technology-related initiatives to understand that integrating technology to support learning does not amount to positive changes in the system. Furthermore, technology initiatives post challenges that must be considered before making decisions that can indeed have counterproductive effects on the welfare of teachers, students, and the community at large. Research in the area of technology integration, particularly, the implementation of One-to-one computing programs in rural schools is needed as small school districts must be strategic about undertaking financial and operational changes that can create significant challenges to the system as a whole.
CHAPTER 3

Method

In this program evaluation, I intended to find answers to several questions to assess the value of the One-to-one Chromebook initiative at the high and middle school levels in a rural school district in the state of Virginia. This evaluation followed a pragmatic paradigm as its results can be used to make decisions about the effectiveness in the implementation of the program to allow school leaders to learn from and build upon successes in the pilot phase of this initiative as the program expands to cover more grade levels. Qualitative and quantitative methods were used to gather the data, which were used to indicate findings, conclusions, and recommendations.

The questions below guided the assessment of the effectiveness of the program in relation to its goals:

1. What is the perception of stakeholders regarding the implementation of the Chromebook initiative in this school district?

2. How do core instructional practices at SMS and SHS demonstrate the division’s goal to engage student in meaningful curricular content through the purposeful and effective use of technology? (Goal 2)

3. To what extent has the Chromebook initiative afforded students the opportunity to use technology to gain knowledge and develop skills? (Goal 3)

This program evaluation employed a convergent parallel mixed methods design, which Creswell (2014) described as follows, “Both qualitative and quantitative data provide different types of information often, detailed views of participants qualitatively.
and scores on instruments quantitatively, and together they yield results that should be the same” (p. 219). The results from the surveys along with the themes from the interview were used to examine similar results regarding the perception of stakeholders, current instructional practices in the schools and opportunities for students to employ their knowledge of technology in and outside of the classroom.

I was guided by the Use Branch Approach of program evaluations, which frames the evaluation process around three major aspects: Activities, connection of goals with activities and how they together facilitate success or failure in the implementation of the initiative within a given context. I evaluated the process of implementation in accordance with the utility standards U5 (Relevant information), U6 (Meaningful Processes and Products) and U8 (Concern for Consequence and Influence).

**Participants**

This evaluation involved the most pertinent groups regarding this study: School administrators, teachers and parents of students in Grades 5, 6, 9, and 10, as well as students in these grade levels. They were distributed among the following groups: 10 school administrators, 30 high school teachers, 12 middle school teachers, approximately 300 parents and 200 students were asked to participate in the study, 50 students from each of the grade level in which the Chromebook Initiative had been implemented. The overall response rate for the completion of surveys among the four stakeholder groups was 28% as 157 participants completed the surveys.

**School administrators.** The district’s leadership team included: superintendent, directors, principals, assistant principals, and department chairs. The school leadership team was responsible for teachers’ training and fidelity to the vision of the school district in the classrooms. Members of the leadership team promoted, supervised, and
disseminated all major components of the program among stakeholders. For the purpose of this study, surveys were administered to the following members of the district’s leadership team: The school district’s superintendent, director of operations, director of special education and the high school and middle school principals and assistant principals.

The director of instruction and the instructional technology resource teacher were responsible for the implementation and evaluation of the One-to-one Chromebook initiative in this school district. Additionally, they prepared and provided teachers and students with training and coaching opportunities to integrate technology into the classroom. The network administrator and the coordinator of data, testing and accountability were also part of the committee. They ensured the appropriate distribution of Chromebook computers to students and teachers and monitored their compliance with the district’s Computer Use Policy. The four members of the school district’s Technology Integration team were invited for an interview to explore their level of involvement, views and assessment of the Chromebook initiative in the school district. Two of the four members agreed to participate in the interview process.

**Teachers.** The essence of the program and its sustainability is concretely identifiable by the delivery of instruction in the classroom. Teachers are one of the most important part of the inputs because they play an important role in the execution of the activities, and they carry the implementation in practice, which determines the outcomes of the program. Teachers who taught Grades 5, 6, 9, and 10 were invited to participate in this study. The sample included core area teachers (math, science, social studies and English) and elective course teachers (art, foreign languages, band, and PE). The school SHS faculty had a total of 18 core area teachers and 12 elective course teachers. The
SMS faculty included a total of 12 teachers as the program had been implemented only in the fifth and sixth grade levels. The response rate for administrators and teachers was 55.7%.

**Parents.** Parental involvement is paramount in the learning process. The One-to-one Chromebook initiative at SHS and SMS requires support from parents. Parents can have a huge influence in how students understand the benefits of technology outside of school. This study included the participation of parents from both SHS and SMS. Their participation was voluntary. Approximately 300 parents received an electronic invitation to complete a short survey regarding the Chromebook initiative in the school system. Out of three hundred parents, 80 parents participated in the study, which is equivalent to a response rate of 27% of the population for this group.

**Students.** Understanding the attitudes toward technology and usefulness of Chromebooks in the learning experiences of SHS and SMS students is imperative to the overall purpose of this study. This evaluation included a random selection of approximately 50 students per grade level, who were enrolled in the 5th, 6th, 9th, and 10th grades. Their participation was voluntary, and their English teachers were asked to administer the survey during the English class periods. Out of approximately 200 students among the four grade levels, 48 participated in this study, which is equivalent to 24% of the population.

Consent from parents was collected prior to the administration of the surveys. Only those students with parental permission were administered surveys. All surveys were administered during the English class period. Students, who did not have parental consent, were given an alternative assignment. Students received raffle tickets as a form of appreciation for their participation. The tickets gave them a chance to win movie
tickets and gift cards. Winning numbers were announced by the teachers in each of the participating classes at the end of the two weeks survey administration period.

**Data Sources**

Quantitative and qualitative data were used to complete the evaluation. I created the surveys in consultation with experts in the technology integration field. Two professors from the College of William & Mary, with expertise in technology integration, served as a panel of experts to assess the content validity of the surveys. Additionally, I administered a pilot study of the survey to a select group of 20 individuals with similar profiles as the participants in the study. These individuals allowed me to gather input with respect to the clarity of the surveys, so that I could identify adjustments that needed to be made before conducting the study.

**Surveys**

The surveys sought to gather data applicable to the context of the study, and the alignment with the goals of the 2015-2018 Technology Plan. Respondents indicated their perceptions and understanding of the One-to-one Chromebook Initiative and its benefits. The surveys focused on various categories such as best practices, quality of the product, enhancement of the teaching and learning process, learning opportunities outside of the classroom and stakeholders understanding of the district’s vision. All surveys included a participant consent form to safeguard the integrity of the Study and confidentiality of the participant.

**School administrators survey.** The school survey contained seven questions, and they explored the perception of the district administrators regarding the use of Chromebooks in the classroom, and its influence in current instructional practices and student engagement. See Appendix B. A sample question included:
How familiar are you with the goals and vision included in the 2015-2018 addendum to the technology plan of your school district?

☐ Very familiar  ☐ Somewhat familiar  ☐ Not familiar at all

**Teacher survey.** The teacher survey had twelve questions, which focused on the teachers’ ability to use Chromebook computers as a teaching resource, frequency of use, and the amount of support that they have received in the implementation of the Chromebook initiative. See Appendix C. A sample question included:

How often does your ITRT provide you with individualized support to enhance the use of Chromebooks in your classroom?

☐ Daily  ☐ Once a week  ☐ Upon request  ☐ Once a month

**Parent survey.** The parent survey explored the perception of the parents regarding Chromebooks in the classroom, and their understanding of how the implementation of the initiative in the school district had impacted the teaching and learning experiences of the students. The parent survey was administered electronically, and it included six questions. See Appendix D. A sample question included:

Do you find the Chromebook computer to be a beneficial tool for your child’s learning?

☐ Very beneficial  ☐ Somewhat beneficial  ☐ Not beneficial at all

**Student survey.** The student survey consisted of eight questions related to the proficiency levels of the students as well as questions concerning the usability of the Chromebook computers for learning. Parents signed a consent form, giving permission for students to participate in the study. See Appendix E and F. A sample question included:

How often do you use your Chromebook to work on school assignments at home?

☐ Daily  ☐ Twice a week  ☐ Only if required  ☐ Never
**Interviews.** Members of the Technology Integration Team were interviewed to determine their involvement in the planning and implementation stages of the Chromebook Initiative at SMS and SHS, and their perception of the program thus far. Out of four members, two agreed to participate, as they did not have much involvement in the implantation stages of the initiative. The interview consisted of 10 questions. Appendix G contains all interview questions. A sample question was: What do you believe are some of the drawbacks of implementing the One-to-one Chromebook initiative in classrooms.

**Data Collection**

Participation in the evaluation was voluntary, and participants were not identified. Additionally, I created a table of specifications to illustrate the alignment that existed between the goals of the One-to-one Chromebook initiative, the evaluation questions and data sources to strengthen the validity of evaluation process. See Appendix H. Surveys were created using the Qualtrics Program, and were administered electronically to school administrators, teachers, parents, and students. The surveys were available over a two-week period. An e-mail with a link to the surveys was sent to administrators, teachers and parents. Hard copies were also available for those who preferred to provide feedback in written form. Parents received a link to the surveys using a web-based platform called, RSchool, a system that is used by different school districts to send information to a large group of individuals.

English teachers were responsible for giving and collecting consent to participate forms from the students. Parents of students in Grades 5, 6, 9, and 10 received a hard copy of the consent form to give authorization for their child to complete the survey. After the English teachers furnished me with the consent forms, a link was sent to each of
the teachers for them to complete the survey administration process. Only those students whose parents had given their consent participated in the study. Students received a link to complete the survey on their computers or phone during their English class period.

Because the surveys were administered during the last month of school when computers had to be returned for them to be stored in the schools for the next school year, some students did not have access to computers, for which hard copies of the student surveys were used. Some of the students completed the hard copy version of the student survey. SMS teachers returned the completed student surveys in a sealed envelope through interoffice mail, and SHS teachers placed them in my mailbox.

Interviews were scheduled with members of the technology team via e-mail. Each member of the team was given an opportunity to indicate the time and location that were suitable to the schedule. Interviews were conducted in approximately 20 minutes. Interviews with members of the committee were conducted in the high school building, in the assistant principal’s office. Both interviews lasted approximately 20 to 30 minutes, and they were recorded and later transcribed for analysis. Responses were recorded anonymously by assigning an alias to the interviewees to preserve the confidentiality and anonymity of the responses. The interview responses were kept in a confidential file only accessible by the evaluator.

Data Analysis

The surveys, and interviews allowed me to interpret patterns that created themes that were evaluated to draw conclusions about the program. To analyze the results of surveys and interview questions, question items were grouped into two categories: Focus questions and background information. The background information will be used to expand upon the analysis of the results derived from the data collected through focus
questions. The focus questions were designed to respond to the evaluation questions as indicated in the table of specifications. See Appendix H.

Table 1

*Description of the Data Collection Process in Relation to the Evaluation Questions*

<table>
<thead>
<tr>
<th>Evaluation Question</th>
<th>Data Sources</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is the perception of stakeholders regarding the Chromebook initiative in this school district?</td>
<td>Surveys</td>
<td>Comparative analysis</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td>Descriptive Statistics</td>
</tr>
<tr>
<td>2. How do core instructional practices at SMS and SHS demonstrate the division’s goal to engage student in meaningful curricular content through the purposeful and effective use of technology? (Goal 2)</td>
<td>Surveys</td>
<td>Descriptive statistics</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Interpretation</td>
</tr>
<tr>
<td>3. To what Extent has the Chromebook initiative afforded students the opportunity to apply technology effectively to gain knowledge and develop skills?</td>
<td>Surveys</td>
<td>Comparative analysis</td>
</tr>
<tr>
<td></td>
<td>Interviews</td>
<td>Descriptive Statistics</td>
</tr>
</tbody>
</table>

To assess the effectiveness in the implementation process of the One-to-one Chromebook initiative, it was necessary to analyze the role of stakeholders in the program, and the impact of their perception in achieving the goal of the program. The data sources generated information, which was analyzed through both descriptive analysis, and interpretation. A descriptive analysis presents a visual summary of the data collected through surveys and the responses of the participants.

Additionally, to determine the degree to which student engagement in the use of technology was evident; I measured the responses from the surveys and interviews that I created with the support from experts in the technology field against the descriptors of the Technology Integration Matrix developed by the Florida Center for Instructional Technology at the University of South Florida. See Appendix I, Table of Summary.
Descriptors for the TIM. This process was used to expand upon the data collected through the surveys and interviews. The information obtained from comparing specific question items in the teacher and student surveys against the Technology Integration Matrix was proposed to solidify the conclusions and recommendations of this evaluation.

**Surveys.** Data from the surveys were analyzed using descriptive statistics. The value of stakeholders’ perception was determined using literature that supported the findings of this study. The surveys were also used to compare data obtained through the responses of the different stakeholders. The comparative analysis demonstrated the similarities and differences across various stakeholder groups in the findings. Some survey questions were repeated to determine the consistency among responses specifically between teachers and students.

**Interview.** The interviews were recorded and transcribed. An analysis of the transcript was conducted to find common themes, which were codified to draw conclusions regarding the Technology Integration Team’s involvement and perception of the initiative, its strengths and weaknesses as well as its impact on instruction. The interview questions prompted additional conversations that allowed me to obtain additional data, with regard to the planning process of the initiative.

In adherence to confidentiality measures, the responses were recorded under two different aliases: Alpha and Omega. A priori codes were used to guide the analysis of the transcripts recorded from each of the interviews. The codes were: training as planned, training as conducted, leadership training, engagement, use of Chromebooks in classrooms, technology integration, internet, discipline, funding and use for non-instructional purposes. Both transcripts were reviewed, transcribed, and analyzed. Common themes were color coded and entered in a spreadsheet.
**Researcher as Instrument**

The formative nature of this evaluation responded to the need for assessing the One-to-one Chromebook initiative’s worth to the district’s mission and vision, and as it pertained to allocating fiscal and human resources to optimize the instruction across all educational levels in the school system. My role was to serve as an internal evaluator. I held a leadership role in the school district, serving as an assistant principal of SHS, but I was not involved in the planning process of the Chromebook initiative, and I was not closely associated with the implementation stage of the program.

To minimize the possibilities for any bias due to my role as an administrator in one of the schools where the study was being conducted, surveys were preceded by a participant consent form, which included a statement, asking participants to provide their honest feedback. Additionally, the lack of open-ended questions ameliorated biases because the surveys gave participants specific choices that were aligned with the goals of the evaluation. Finally, all surveys were confidential, and participation was voluntary safeguarding, the integrity of the participants and the validity of the study.

**Delimitations, Limitations, Assumptions.**

**Delimitations.** This study was focused on the One-to-one Chromebook initiative in high school and middle school, in a rural school district in the southern part of Virginia. This study was framed upon the information obtained from the 2015-2018 district’s technology plan. This study had a focus on the delivery of instruction and its implications on the learning process among middle and high school students in Grades 5, 6, 9, and 10, as they engaged in the purposeful and effective use of Chromebook computers.
The evaluation was limited to the data provided by the stakeholders through the administration of surveys and interviews. The data analysis examined the relationship between surveys administered to the participants, evaluation questions and goals included in the district’s technology plan, as well as the analysis of the interview data. See Appendix G.

**Limitations.** Participation in this study was voluntary, which influenced the results of the evaluation, as the data collection process was based on the number of participants who agreed to complete the surveys or participated in the interviews. The administration of the student survey was contingent on parents’ consent to allow their children to participate as well as the presence of the students in the middle or high schools during the regular school day.

**Assumptions.** This evaluation assumed that the implementation of the One-to-one Chromebook initiative at the high school and middle school levels, in a rural school district, could be successful given the following factors: school district’s financial sustainability to support the gradual implementation of the initiative in all grade levels. The purchase of a computing device that is suited to the needs of the students. Training for teachers and students that promotes the goals stated in the district’s technology plan to pave the way for academic success.

**Ethical Considerations**

The approval of the College of William & Mary’s Institutional Review Board was sought once the dissertation committee approved the proposal. After authorization from the College of William & Mary Institutional Review Board was granted, permission was requested to the school district superintendent to conduct the study. Permission from the school board office as well as school principals was negotiated. Upon approval from all
pertinent parties, data were collected, and results were analyzed. The evaluation of the One-to-one Chromebook initiative adhered to the following standards of evaluation:

**Utility.** The evaluation was conducted by a participant observer, who had received academic preparation in the field. The evaluation responded to various stakeholders including school administrators, parents, students, and teachers. The results of the evaluation were negotiated to serve the needs of stakeholders. This evaluation underlined the value of the findings as it might become applicable to other school systems.

**Feasibility.** The evaluation followed a well-elaborated plan before it was conducted in its context. The evaluator used the appropriate resources to obtain data that could effectively address the needs of the program.

**Propriety.** The data, findings, and information obtained through the evaluation process were confidential, and it served only the specified purposes of the evaluation.

**Accuracy.** This evaluation reports only results that are consistent in accordance with the reliability of the sources from where they are obtained. I was one of the school administrators at this school. I observed professional and ethical principles in the process. The evaluation did not conflict with my role as a school administrator because the evaluation benefits the school and the district as the program has the potential to be improved or modified based on the findings and the analysis that have been generated from this study.
CHAPTER 4

Results

The Summerville County Public School District invested a large sum of money to roll out the implementation of the One-to-one Chromebook Initiative at Grades 5, 6, 9, and 10. The district plans to expand this program in all grade levels during the 2018-2019 school year. The purpose of this mixed methods study was to evaluate the implementation of the One-to-one Chromebook Initiative in relation to two specific goals (Goals 2 and 3) included in the 2015-2018 Addendum of the District’s Technology Plan. The data collection process took place from May 16th to June 26th, 2018. Chapter 4 discusses the results of this study in relation to the evaluation questions.

Data obtained from surveys administered to school administrators, teachers, parents and students and interviews conducted with members of the Technology Integration team are presented through various tables and figures, which will be used to describe qualitative and quantitative data. A description of the participants and question items associated with each evaluation question precede the tables and figures. Finally, a descriptive analysis of the data as it relates to the evaluation questions is included as part of the analysis.

Evaluation Question 1: What is the perception of stakeholders regarding the implementation of the Chromebook initiative in this school district?

The first evaluation question assesses the stakeholders’ perceptions regarding the implementation of the One-to-one Chromebook initiative in this school district. The perceptions correspond to the stakeholders’ views of the impact, benefits, utility, value,
strengths, and challenges in the implementation of the Chromebook computers initiative.

In reference to the first evaluation question, question items seven of the school administrator survey and item twelve of the teacher survey asked the respondents to select the statements that best described their views of the impact of Chromebook computers in their School District. Seven of 10 school leaders and 22 of 40 teachers responded to the question. Table 2 provides summary of the responses.

Table 2

_Administrators’ and Teachers’ Perceptions of the Chromebook Initiative_

<table>
<thead>
<tr>
<th>Statements</th>
<th>Administrators</th>
<th>Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enhances the delivery of instruction</td>
<td>86%</td>
<td>55%</td>
</tr>
<tr>
<td>2. Provides opportunity for various modalities for assessments.</td>
<td>71%</td>
<td>45%</td>
</tr>
<tr>
<td>3. Provides opportunity for various modalities in the delivery of instruction.</td>
<td>86%</td>
<td>55%</td>
</tr>
<tr>
<td>4. Minimizes classroom disruptions.</td>
<td>14%</td>
<td>22%</td>
</tr>
<tr>
<td>5. Improves student academic performance.</td>
<td>0%</td>
<td>36%</td>
</tr>
<tr>
<td>6. Maximizes online learning opportunities in the classroom.</td>
<td>71%</td>
<td>55%</td>
</tr>
<tr>
<td>7. Allow teachers opportunities to provide immediate feedback.</td>
<td>29%</td>
<td>59%</td>
</tr>
<tr>
<td>8. Distracts students during instructional time.</td>
<td>29%</td>
<td>31%</td>
</tr>
<tr>
<td>9. Gives students options for dishonesty in completing work.</td>
<td>29%</td>
<td>31%</td>
</tr>
<tr>
<td>10. Provides teachers and students an additional source of communication.</td>
<td>86%</td>
<td>55%</td>
</tr>
<tr>
<td>11. Stimulates students’ critical thinking skills through research-based learning activities.</td>
<td>43%</td>
<td>36%</td>
</tr>
</tbody>
</table>

*Note. N=7 (Administrators); N= 22 (Teachers)*

Out of the 11 statements, the following statements were the top selections of 86% of school administrators: The One-to-one Chromebook Initiative enhances the delivery of
instruction, provides opportunity for various modality in the delivery of instruction, and provides teachers and students an additional source of communication. In addition, the same statements were the second top selections made by 55% of teachers. The first top selection of 59% of teachers was Statement 7, which indicated that the Chromebook initiative allows teachers opportunity to provide immediate feedback. None of the school leaders chose Statement 5, that the Chromebooks improved academic performance. The lowest percentage of selections among teachers corresponded with Statement 4, that the Chromebooks minimized classroom disruption.

Question 3 of the parent survey asked respondents to select the statements that were more applicable to their perception of the Chromebook initiative in the Summerville County Public School district. Parents could select more than one option. Eighty parents responded to this question. Table 3 contains a summary of the responses.

Table 3

<table>
<thead>
<tr>
<th>Statements</th>
<th>Count</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>It supports my child’s effort to complete school related work at home.</td>
<td>28</td>
<td>35%</td>
</tr>
<tr>
<td>It has become a disruption for my child.</td>
<td>16</td>
<td>20%</td>
</tr>
<tr>
<td>I feel confident that with the introduction of Chromebooks, my child has new skills to succeed in post-secondary education.</td>
<td>16</td>
<td>20%</td>
</tr>
<tr>
<td>It has helped my child improve his/her academic performance.</td>
<td>14</td>
<td>17.5%</td>
</tr>
<tr>
<td>Other, explain</td>
<td>14</td>
<td>17.5%</td>
</tr>
<tr>
<td>Due to financial hardship, we were unable to secure a Chromebook.</td>
<td>12</td>
<td>15%</td>
</tr>
</tbody>
</table>

Note: N = 80

Statement 2, “It supports my child’s effort to complete school related work at home” received the highest percentage of selections, with 35% of the parents selecting this
response. Other viewpoints emerged from the 17.5% group of parents who selected other as option. The respondents stated that the Chromebook initiative is not a good fit for the school district due to the lack of a reliable internet provider in the area. Other concerns that were addressed were the use of the students’ use of Chromebook computers to visit inappropriate sites and play games at home, stressing their disapproval of the initiative.

Question 6 of the parent survey asked parents to indicate whether or not they found Chromebook computers beneficial to their child’s learning. Fifty-one parents responded to this question. Figure 3 provides a visual representation of the responses.

![Figure 3. Visual representation of parents’ responses to the following question, Do you find Chromebook Computers beneficial to your Child’s learning?](image)

Three out of every four parents found the Chromebook computers to be beneficial to their child’s learning. This coincides with the results shown in Table 3, in which 52.5% of the respondents chose the statements that alluded to the benefits of the Chromebook.
Computer initiative in the learning process.

To understand the perception of students regarding the implementation of the Chromebook initiative in their school district, Questions 5 and 6 of the student survey asked students to determine whether or not Chromebook computers are valuable to their learning experiences and how helpful the Chromebook computers are to them to complete their class assignments at home. Forty-six students responded to both questions.

Table 4 presents the results from responses obtained through Questions 5 and 6 of the student survey. Students were given three choices to rate their perception of the Chromebooks: Yes, somewhat and no.

Table 4

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>Somewhat</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you find Chromebooks to add value to your learning experiences?</td>
<td>80%</td>
<td>N/A</td>
<td>20%</td>
</tr>
<tr>
<td>2. Is your Chromebook helpful to you when completing assignments at home?</td>
<td>57%</td>
<td>24%</td>
<td>19%</td>
</tr>
</tbody>
</table>

Note. N = 46

A large percentage of the students, 80%, concurred in that the Chromebooks add value to their learning experiences. A smaller proportion but still a majority indicated that they are helpful when completing assignments at home. In Questions 5 and 6 of the student survey, students were also given an option to elaborate upon their selections regarding the value and helpfulness of the Chromebooks. Figure 4 provides a summary of the common themes that emerged as students explained their selection of the choices given in the surveys about the value and helpfulness of Chromebook computers in their learning.
Figure 4. Students’ explanation of the value of Chromebooks in their learning experiences. The blue columns represent students’ positive views of the Chromebooks, and the red columns describe students’ negative views of the Chromebooks.

Statements in Figure 4 are organized from the largest to the smallest number of respondents. The blue columns represent the opinions of the students who responded positively to both Questions 5 and 6, and the red columns refer to the explanations of those who answered no. The illustration reveals that a large percentage of students view Chromebook computers as helpful and valuable tools to improve their learning experiences either at school or home, and that the use of Chromebooks to help them to find resources faster, which was the most common opinion among student respondents.

Interviews were conducted with two of the four members of the district’s technology Integration Team. The other two members chose not to participate because they were not involved in the implementation stages of the initiative. The interview
process lasted approximately 20 to 30 minutes, and they were recorded both in writing and using voice memo feature of an iPhone. To gather perspectives from members of the district’s Technology Integration Team regarding the implementation of the Chromebook initiative, Questions 3 and 4 of the interview asked about the strengths of the implementation of the One-to-one Chromebook initiative in this school district and the challenges that they could identify during the implementation stage of the One-to-one Chromebook initiative.

Table 5 compiles the perceptions between the two members of the district’s technology Integration team regarding the strengths and challenges that they identified during their interviews. The strengths and challenges that the participants were able to list throughout the interview are presented in the table.

Table 5

*Strengths and Challenges in the Implementation of the Chromebook Initiative*

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Alpha</th>
<th>Omega</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective communication between teacher and students.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Efficiency in testing.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>An increase in the use of e-mails by students.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Administrative Support</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Teachers’ Willingness to learn</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Alpha</th>
<th>Omega</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Parental Support</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Lack of Funding</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Emphasis on the device and no its instructional value</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>No set expectations for instructional purposes</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*Note.* N=2. The X indicates what strengths or challenges were identified individually by the respondents to highlight those in which both participants agreed.
The two members of the district’s Technology Integration Team did not agree in any of the strengths that were outlined during the interviews. However, they both concurred in that two challenges in the implementation of the One-to-one Chromebook Initiative in this school district were the lack of funding and no having set expectations as of how Chromebooks were to be used effectively for instructional purposes.

**Evaluation Question 2: How do core instructional practices at SMS and SHS demonstrate the division’s goal to engage student in meaningful curricular content through the purposeful and effective use of technology? (Goal 2)**

The second evaluation question assesses how students engaged in meaningful curricular content through the purposeful and effective use of technology based on instructional practices at SMS and SHS. Goal 2 of the 2015-2018 Addendum to the school district’s technology plan indicates that through the implementation of the Chromebook initiative students would engage in meaningful curricular content through the purposeful and effective use of technology. For this reason, this study sought to collect data to determine instructional practices at SMS and SHS that aligned with the division’s goal to engage students in meaningful curricular content through the purposeful and effective use of technology.

Questions 5 and 6 of the school administrator survey inquired about the instructional leadership practices of the school district to understand the role of school administrators in promoting student engagement through teaching practices that centered on the purposeful and effective use of technology in the classroom. Seven out of 10 school administrators responded to this question. Table 6 compiles the data.
Table 6

School Administrators’ Efforts to Promote the Use of Chromebooks for Instruction

<table>
<thead>
<tr>
<th>Statements</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide professional development and training opportunities for teachers.</td>
<td>6</td>
<td>86%</td>
</tr>
<tr>
<td>Use post-observation conferences to share strategies/ideas for teachers to use in their classrooms.</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>Model examples of how to integrate the use of Chromebook computers during faculty meetings.</td>
<td>3</td>
<td>43%</td>
</tr>
<tr>
<td>Use google as a platform for faculty and staff to collaborate.</td>
<td>2</td>
<td>29%</td>
</tr>
<tr>
<td>My leadership role does not afford me the opportunity the opportunity to promote the use of Chromebook computers as an instructional tool.</td>
<td>2</td>
<td>29%</td>
</tr>
</tbody>
</table>

Note. N = 7

The majority of school administrators selected professional development and training opportunities for teachers as their option to promote the use of Chromebook computers for instructional purposes with 86% of responses, followed by the use of post-observation conferences to share strategies and ideas for teachers to use in their classrooms with 57% of responses.

Questions 7 and 8 on the teacher survey examined how often and for what instructional purposes teachers used computers in their classrooms. Twenty-two teachers answered Questions 7 and 8. Each question included multiple options from which they could choose as well as explain their selections. Figure 5 shows the results collected from the responses given to Question 7.
Figure 5. Teachers’ frequency of Chromebook use in the classroom (N=22). Teachers explained how often they Chromebooks for instructional purposes in the classroom to establish the difference between the use of the device in school versus home.

Seventy-three percent of teachers reported to use Chromebook computers at least once in a 30-day period of time. The highest percentage of teachers indicated they use Chromebooks in their classrooms every day, while the second largest group of teachers indicated that they never or seldom use Chromebook computers in their classes. Additionally, out of the 22 teachers who answered the question, 14 of them taught a core class. Eight out of 14 core area teachers recorded everyday as their choice.

Question 8 of the teacher survey provided the respondents with 18 different choices to identify how students use Chromebook computers in their classes. Choices could be selected multiple times. Table 7 contains a summary of the responses.
Table 7

*Teachers’ Account on Students’ Use of Chromebooks in the Classroom*

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google Classroom</td>
<td>13</td>
<td>59%</td>
</tr>
<tr>
<td>Assessment</td>
<td>10</td>
<td>45%</td>
</tr>
<tr>
<td>Google Docs to prepare reports and individual writing activities</td>
<td>10</td>
<td>45%</td>
</tr>
<tr>
<td>Google Slides to prepare individual presentations</td>
<td>9</td>
<td>41%</td>
</tr>
<tr>
<td>Lesson related Practice activities</td>
<td>9</td>
<td>41%</td>
</tr>
<tr>
<td>Homework</td>
<td>7</td>
<td>32%</td>
</tr>
<tr>
<td>To take notes</td>
<td>6</td>
<td>27%</td>
</tr>
<tr>
<td>Google Docs to collaborate with a classmate in written assignments; each student has access to a computing device</td>
<td>6</td>
<td>27%</td>
</tr>
<tr>
<td>Google Slides to prepare group presentations, working in collaboration and simultaneously with other classmates.</td>
<td>6</td>
<td>27%</td>
</tr>
<tr>
<td>Educational Games</td>
<td>4</td>
<td>18%</td>
</tr>
<tr>
<td>E-mail</td>
<td>4</td>
<td>18%</td>
</tr>
<tr>
<td>To access the content of their textbooks and practice activities online</td>
<td>3</td>
<td>14%</td>
</tr>
<tr>
<td>Charts</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Spreadsheets</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Video Recording</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Blended learning (at least 40% of course is presented online with direct instruction delivered in the classroom)</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>To reach books online</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Google Hangout</td>
<td>1</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Note.* N= 23

The results show that the Google classroom application has the most purposeful use in the classroom as this was selected by 59% of teachers. Assessments and the use of Google Docs to prepare reports and individual writing activities represent the second most selected choice among teachers with 45% of responses for each category. Google
hangout, charts, spreadsheets video, recording, blended learning and to read books online were obtained the least amount of selections with just 5% selection rate.

To determine the level at which students have engaged in meaningful curricular content through the effective use of technology, Questions 4, 8 and 9 of the Student Survey focused on the collection of data to identify the subjects, students’ preference in the use of a particular technological device for instruction and their use of Chromebooks in class. Thirty-eight out of 48 participants completed this part of the survey. Table 8 provides a summary of students’ responses concerning the subject in which Chromebook computers are used most often. The selections included: English, social studies, math, science, foreign languages, fine arts, health and PE, and agriculture.

Table 8

*Frequency of Chromebook Use in Different Subject Areas According to Students*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>English</td>
<td>24</td>
</tr>
<tr>
<td>Social Studies</td>
<td>7</td>
</tr>
<tr>
<td>Math</td>
<td>3</td>
</tr>
<tr>
<td>Science</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>1</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>0</td>
</tr>
<tr>
<td>Health and PE</td>
<td>0</td>
</tr>
<tr>
<td>Agriculture</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency of Use</th>
<th>Most often</th>
<th>Least often</th>
</tr>
</thead>
</table>

*Note. N = 38*

The majority of respondents indicated that English is the subject in which Chromebooks are more often used, followed by social studies. The majority of respondents also selected
agriculture as the subject in which Chromebooks are the least often used for learning purposes.

The Student Survey also asked students to identify the purposes for which Chromebook computers were used in class. Forty-two students responded to this question. Table 9 shows the data gathered from this question.

Table 9

*Students' Account on the Use of Chromebooks in the Classroom*

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
</table>
| Google Classroom                                     | 39    | 93%
| Assessment                                           | 36    | 86%
| Homework                                             | 32    | 76%
| To take notes                                        | 31    | 74%
| Google Docs to prepare reports and individual writing activities | 27 | 64%
| Google Slides to prepare individual presentations    | 26    | 62%
| Lesson related Practice activities                   | 24    | 57%
| E-mail                                               | 23    | 55%
| Games                                                | 22    | 52%
| Google Slides to prepare presentations, working in collaboration | 17 | 40%
| Google Docs to collaborate with a classmate in written assignments | 14 | 33%
| Google Hangout                                       | 12    | 29%
| To access the content of their textbooks and practice activities online | 9 | 21%
| Spreadsheets and to reach books online               | 7     | 17%
| Charts                                               | 4     | 10%
| Video Recording                                      | 1     | 2%

*Note.* N = 42

The data reveals that 93% of respondents concurred in that Chromebooks are used to access Google classroom as the top-rated category, which coincides with the teachers’ selection. After Google classroom, assessment is the second top-rated category based on
data from the Student Survey. Video recording obtained the number lowest of all categories regarding the use of Chromebooks in the classroom.

At SMS and SHS, technology is visible in different ways. Although the official technology tool for instructional purposes at SMS and SHS is Chromebook, a large group of students have cellphones or some other kind of technological device that allow them to complete class related activities assigned by the teachers.

Question 8 of the Student Survey seeks to find the device preferred by students to complete class assignments. Figure 6 shows the choices and result.

![Figure 6](image.png)

*Figure 6. Students’ preferred device to work on school assignments. Students selected the device that they preferred to use when completing class-related work.*

Figure 6 illustrates that 42% of respondents indicated that Chromebook computers are the preferred device to work on school assignments. Under other, 3% of the respondents stated they would prefer to use paper to complete Chromebook assignments.
Evaluation Question 3: To what extent has the Chromebook initiative afforded students the opportunity to use technology to gain knowledge and develop skills? (Goal 3)

The third evaluation question explores how the Chromebook initiative has afforded students the opportunity to apply technology effectively to gain knowledge, develop skills, and demonstrate understanding of technology in the 21st century. Data have been extracted specifically from the teacher, parent and student surveys as well as the interview with the members of the technology Integration Team.

In Question 9 of the teacher survey, teachers were asked to indicate whether the content of their classes was available online. The question also asked teachers to identify some of the activities that they assign their students to complete online. Online activities are any type of task completed via internet in class or at home. Sixteen out of 22 participants responded to this question. Figure 7 shows an illustration of the results.

*Figure 7. Availability of teachers’ class content online (N=16 Teachers). Teachers indicated where or not they have made the content of their courses available online.*
More than half of the teacher respondents indicated that the content of their classes was available online. Those who responded affirmatively also listed similar activities that are available for each their courses online. These activities included: quizzes, practice worksheets, and research.

The last item in the teacher survey, Question 13, asked teachers to identify some of the opportunities that they had available for their students to demonstrate their ability to use Chromebooks effectively to showcase their understanding of the lesson or topics discussed in their classes. Teachers could select more than one option. Nineteen out of 22 teachers responded to this question. Table 10 provides a summary of the data.

Table 10

<table>
<thead>
<tr>
<th>Class-related Activities for Students to Showcase their Ability to use Chromebooks</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete online assessments in the classroom guided by the teacher.</td>
<td>7</td>
<td>37%</td>
</tr>
<tr>
<td>Upload class assignments to their Google classrooms</td>
<td>7</td>
<td>37%</td>
</tr>
<tr>
<td>Complete assessments or homework activities online independently without direct guidance from the teacher.</td>
<td>5</td>
<td>26%</td>
</tr>
<tr>
<td>Download homework or handouts.</td>
<td>5</td>
<td>26%</td>
</tr>
<tr>
<td>Email late assignments, questions, concerns about the class using appropriate conventions for electronic communication.</td>
<td>4</td>
<td>25%</td>
</tr>
<tr>
<td>Use Google hangout or any other form of virtual interaction to participate in distance learning.</td>
<td>3</td>
<td>16%</td>
</tr>
<tr>
<td>Use Google applications to create presentations, reports, etc.</td>
<td>3</td>
<td>16%</td>
</tr>
<tr>
<td>Other, Explain</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

*Note. N=19*

The use of Chromebooks to complete online assessments in the classroom with teachers’ guidance and to upload class assignments to students’ Google classrooms were the most
selected activities. The use of Google applications such as Google Hangout and Google Slides were the least selected activities.

The effective use of technology in the 21st century involves the extension of the teaching and learning process beyond the classroom. Questions 2 and 4 of the parent survey provided parent respondents with choices for them to determine the proficiency level of their child in the use of Chromebook computers as well as the frequency of use for educational purposes at home. These questions were geared toward assessing the opportunities to apply technology effectively through the use of Chromebook computers to demonstrate understanding of technology in the 21st century through the purposeful use of the device in a setting other than the classroom. Question 2 asked parents to describe the proficiency level of their child(ren) on the use of Chromebook computers. The options were: advanced, intermediate, and basic. Fifty-two parents responded to this question. Figure 8 illustrates the responses.

Figure 8. Parents’ estimates of their child’s proficiency level on the use of Chromebooks (N = 52 parents)
A high percentage of respondents considered their child(ren) to have an advanced proficiency level in the use of Chromebook computers. In explaining their responses, 65% of the respondents concurred in that their child(ren) do not need any help to operate the Chromebook computers, and the other 35% of the respondents stated their children can or are able to identify and use without any difficulty applications that are specific to the device.

Question 4 of the parent survey gathered information regarding the frequency of use of Chromebooks at home based on a number of activities that can be completed in the device. Table 11 provides a summary of the responses.

Table 11

Students’ Frequency of Chromebook Use at Home According to Parents

<table>
<thead>
<tr>
<th>Use of Chromebook</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion of Homework.</td>
<td>24</td>
<td>6</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Email communication with teachers.</td>
<td>3</td>
<td>11</td>
<td>8</td>
<td>2</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Virtual Lessons.</td>
<td>4</td>
<td>8</td>
<td>7</td>
<td>10</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>To create presentations.</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>13</td>
<td>8</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>To collaborate with classmates using Google applications.</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Facebook, Online Games, YouTube for Personal use or entertainment.</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>To find resources to support learning experiences.</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>19</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>To type papers on Google documents.</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>14</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>For research purposes.</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>To check grades on PowerSchool.</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>24</td>
</tr>
</tbody>
</table>

Frequency of Use

Most often  Least often

Note. N=50
According to parents, their child(ren) most frequent use of Chromebook computers at home was for the completion of homework. The least frequent use of Chromebook computers was to check grades on PowerSchool, followed by the use of Chromebooks for Facebook, online games, YouTube for personal use or entertainment. About half (48%) of the parent respondents agreed on the activities for which Chromebook computers were most and least often used at home.

To evaluate student perceptions of the extent to which the Chromebook Initiative has afforded them the opportunity to apply technology effectively, Questions 2, 7, and 10 of the Student Survey collected data regarding their proficiency level, frequency of use of the Chromebook device at home and technology-related tasks that they are able to complete without difficulty. Forty-six students responded to Question 2, which had three choices for them to rate their proficiency level in the use of Chromebook: advanced, intermediate, and basic. Students’ self-estimation of their proficiency level is illustrated in Figure 9.

![Figure 9](image)

*Figure 9.* Students’ self-estimate of their proficiency level on the use of Chromebooks. Students rated their proficiency level in the use of Chromebooks.
The majority of students identified their proficiency level on the use of Chromebooks at an intermediate level, which was described in the survey as being comfortable with the use of Google applications with some support. Only 7% of the students described their level as basic; background data of the respondents revealed that the majority of 5th graders selected basic at their proficiency level. Additionally, the students’ estimate of their proficiency level differs with that of their parents’ estimate. See Figure 8.

The students’ frequency in the use of the Chromebook computers to complete school assignments at home provides additional information to measure how the Chromebook Initiative afforded students with opportunities to apply technology effectively as it pertained to the development of skills to access and complete assigned tasks without the guidance of the teachers. Forty-five participants responded to this question. Figure 10 summarizes the responses.

![Figure 10](image)

*Figure 10. Frequency of the use of Chromebook to work on school assignments at home. In this question, students provided an approximate number of how often they completed school related assignments using their Chromebooks at home.*
The majority of respondents indicated that they use Chromebook computers to work on school assignments at home only when it is required. The lowest percentage of respondents selected 2-4 times a week as their option for the completion of school-related assignments at home.

Based on a list of instructional technology-related tasks similar to the one included in the teacher survey, the student survey provided students with a list of activities for them to identify those that they are able to complete on their own without difficulty. 46 participants completed this question. Table 11 includes a summary of the responses.

Table 12

*Technology-related Tasks Completed by Students on their own Without Difficulty*

<table>
<thead>
<tr>
<th>Activities</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete online assessments in the classroom.</td>
<td>43</td>
<td>93%</td>
</tr>
<tr>
<td>Use Google applications to create presentations, reports, etc.</td>
<td>42</td>
<td>91%</td>
</tr>
<tr>
<td>Complete assessments or homework activities online.</td>
<td>42</td>
<td>91%</td>
</tr>
<tr>
<td>Upload class assignments to their Google classrooms or any other learning platform.</td>
<td>35</td>
<td>76%</td>
</tr>
<tr>
<td>Email late assignments, questions, concerns about the class using appropriate conventions for electronic communication.</td>
<td>33</td>
<td>72%</td>
</tr>
<tr>
<td>Download homework or handouts.</td>
<td>28</td>
<td>61%</td>
</tr>
<tr>
<td>Use Google Hangout or any other form of virtual interaction to participate in distance learning.</td>
<td>20</td>
<td>43%</td>
</tr>
<tr>
<td>Other, Explain</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

*Note. N = 46 students*

The completion of online assessments in the classroom was the highest rated technology-related tasks selected by students, followed by 91% of participants reporting that they are
able to use Google applications to create presentations reports, and they can on their own complete assessments or homework activities online without any difficulties. The use of Google Hangout or any other form of virtual interaction to participate in distance learning received the lowest percentage with 43% of the total population.

Other instances of how the Chromebook initiative afforded students with a chance to apply technology effectively were gathered through interviews with the two members of the technology integration committee. Both participants coincided that teachers increased their use of a computer software called Hapara to monitor students’ use of Chromebooks in the classroom, which exposed students to a more rigorous technology setting to maintain the integrity and relevance of the instructional process. One of the interviewees reported to see an improvement in the district’s efforts to go green as more work is being completed on the Chromebooks.

The data presented in this chapter correspond with pertinent information gathered from surveys administered to school administrators, students, teachers and parents of students in Grades 5, 6, 9, and 10. Interviews were also conducted with two members of the technology integration team. The results were presented to answer the three evaluation questions included in this study.
CHAPTER 5

Findings and Conclusions

The 21st century has challenged school systems to maximize their resources, in order to optimize the teaching and learning process among students in and outside of classrooms, so that they become part of rigorous academic experiences that can prepare them to be part of a competitive and innovative world. Farhan, Aslam, Jabbar, and Khalid (2018) said,

Innovative technologies can be used to make a spurring classroom environment where students are occupied with learning. A situation where innovation is utilized as a part of creative ways prompts enhanced learning and teaching… Moreover, technology creates possibilities for teachers to address the issues of students with different learning styles using various media. (p. 4912)

The effective integration of technology in the classroom is paramount to safeguard the creativity and intellectual well-being of all students. Implementing computer programs in classrooms without having the appropriate measures to assess their effect in instruction can become a distraction for both teacher and learners, hindering the possibilities for students to develop additional skills and obtain new knowledge that could ignite their potential.

The purpose of this study was to evaluate the implementation of the One-to-one Chromebook Computer initiative in the Summerville County Public School System to determine how this program supported the goals proposed in the 2015-2018 District’s Technology Plan. This chapter presents conclusions and recommendations that can be
used to propose changes or improvements to the program, and its future in this school district as the program is implemented in additional grade levels. The conclusions and recommendations are focused on the data obtained from the perceptions and conversations with stakeholders.

Discussion of Findings

This formative evaluation sought to answer three evaluation questions, which were generated based on the goals proposed in the 2015-2018 addendum to the district’s technology plan. This evaluation study was based on the theory that the use of technology may awaken students’ interest in the learning process, which will improve the quality and effectiveness of the teaching process. Understanding the perception of stakeholders, the impact of the Chromebook initiative in the classroom, and its effect on shaping students’ skills and improving their knowledge to prepare them for the demands of the 21st century is imperative to measure the overall effectiveness in the implementation stage of the program.

Stakeholders’ Perceptions

The perception among school administrators and teachers regarding the implementation of the Chromebook initiative in SCPS can be synthesized in three statements: It enhances the delivery of instruction, provides teachers with opportunities for various modalities in the delivery of instruction, and provides teachers and students with an additional source for communication. Moreover, a large percentage of parents agreed that the Chromebook initiative supports their child’s effort to complete school-related work at home, which aligns with the second premise of the school administrators and teachers’ perception of the Chromebook initiative as a resource for other ways to deliver instruction.
Findings revealed that the majority of parents and students found the Chromebook initiative to be beneficial to learning. A large group of students agreed on three specific ways in which the Chromebook computers benefited their learning: They can find resources faster online, Chromebooks provide students with internet experience, and students are able to complete work at home. Students’ examples of the benefits that the Chromebook computers offered to their learning align with the parents’ perception of the Chromebook initiative.

Additionally, the interview with members of the district’s technology team found that the strengths of the Chromebook initiative was centered in one major theme, communication. Students and teachers used emails more effectively to interact, while teachers and administrators worked collaboratively in supporting the initiative. The technology integration team members were both in agreement that the lack of funding and lack of specific expectations as it relates to the instructional purpose in the use of the Chromebooks were specific challenges that remained prevalent in the implementation of the Chromebook initiative.

**Purposeful and Effective use of Technology to Engage Students in Meaningful Curricular Content.**

**Technology Integration Matrix (TIM).** The TIM is as a framework that incorporates five important aspects of meaningful learning environments: active, collaborative, constructive, authentic, and goal-directed. They are associated with the five levels of technology integration: entry, adoption, adaptation, infusion, and transformation to produce a matrix of 25 cells that identify how technology is used to enhance learning (Florida Center for Instructional Technology, 2005). Goals 2 and 3 of the Summerville County Public Schools’ Technology Plan indicated that through the implementation of
the One-to-one Chromebook Initiative, students would engage in meaningful curricular content through the purposeful and effective use of technology, and apply technology to gain knowledge, develop skills and demonstrate understanding of the 21st century. The TIM was used to frame the levels of technology integration and the characteristics of learning at SMS and SHS.

**Instructional practices and technology integration at SMS and SHS.** To determine how core instructional practices at SMS and SHS demonstrate how student engaged in meaningful curricular content through the purposeful and effective use of technology, this study measured the findings from the surveys and interviews against the descriptors on the Technology Integration Matrix developed by the Florida Center for Instructional Technology at the University of South Florida. Havens (2014) asserted, “For maximum engagement, technology tools in learning must appeal to social motivation, have opportunities for creativity, personalize the content and experience, engage a mentor or teacher, and provide interactivity and immediate feedback” (p. 1). Per Havens’ assertion, maximum engagement involves various factors that can be summed up to students’ opportunities to experience learning through the active use of a technological device for learning.

In reference to students’ opportunity to engage in meaningful learning experiences through the purposeful and effective use of technology, SMS and SHS practices were identified through any tasks that required the use of technology in and outside of the classroom to complete school-related tasks provided by teachers and completed by students in the Chromebook computers, either at school or at home. Findings revealed that Chromebook computers were the preferred device among most students to complete school assignments. Also, the majority of teachers indicated that
they used Chromebooks for instruction on a daily basis, with 70% of teachers using the Chromebooks at least once a month. English, Social Studies and Science were rated the subject areas in which Chromebook computers were most often used in the classroom.

Among a list of 17 different tasks that could be completed on Chromebooks, findings revealed that Chromebook computers were mostly used by both teachers and students for assessments and to access Google classroom, a platform for students and teachers to extend instruction beyond the classroom. Forty-five percent of students also identified the use of Chromebooks to complete reports on Google documents to prepare reports and individual writing activities.

Data collected also showed a discrepancy between teachers and students in the use of email for communication purposes. Fifty-five percent of teachers reported to use Chromebooks for email purposes, while 18% of students selected this option. This also differed from information collected through the interview with members of the technology integration team, who highlighted that through Chromebooks, email communication between teacher and students had improved.

In measuring the information from the findings regarding how students engaged in the purposeful and effective use of technology, the TIM rubrics places SMS and SHS practices at an active adoption level of technology integration, or the second stage. According to the rubric, at an adoption level, the teacher directs students in the conventional and procedural use of the technology tool. At SMS and SHS, Chromebooks were being primarily used to perform assessment related activities, and to access Google classroom. Google classroom is a platform in which teachers can post discussions, upload materials, record grades, and assess students. Both instances of the Chromebook
computers use highlighted by the majority of teachers and students at SMS and SHS indicated teaching and learning directed by the teacher.

At an active adaptation level, the technology integration rubric suggests the presence of the teacher as a facilitator, while students assume a more independent role in the use of technology under the guidance of the teacher, and technology becomes an important resource for students to keep their notes, develop a product for a given assignment or to use the device to find answers to questions. According to the data presented in Table 12, the least selected choices were those in which students had to participate in self-directed technology related tasks. It is worth noting that the most advanced integration levels included in the TIM are not described in this study as the rubric considers the employment of multiple devices into a given setting to reach the infusion and transformation levels of technology integration. For the purpose of this study, the One on One initiative is limited to the use of Chromebooks to integrate technology in SMS and SHS classrooms.

At SMS and SHS, the learning environment can be placed at a collaborative adoption level as indicated by the descriptor of the technology integration matrix. Students’ account of the use of Chromebook in the classroom indicated that Google applications for collaboration were the least selected of technology-related tasks. Ruman (2017) explained, “At the entry level, the teacher has the control on the technological resources accessed by the students, but at the transformation level, the student chooses the type of technology tool he wishes to” (p. 25). Neither teachers nor students provided any example of tasks that were designed for students to interact digitally with resources other than what the teachers specifically used for their instruction.
Furthermore, the use of Google hangouts or Chromebooks for research obtained were the least selected options among the technology-related tasks that students were able to complete without difficulty, which indicates that technology use is driven by the teachers. School administrators, teachers, parents and members of the technology integration team agreed that teacher and students’ communication through email had increased after the implementation of the Chromebook initiative, which represents an instance of collaboration.

In addition to the information obtained from the technology integration matrix, and in conjunction with Haven’s (2014) view of maximum engagement in the use of technology and the level of technology integration determined by the TIM rubric, the SAMR model categorized student engagement at SMS and SHS at a substitution level in technology integration, which denotes a low level of student engagement. In the substitution level of the SAMR model, technology becomes a substitute for some aspects of teaching; in this case, paper assessments were instead completed on the Chromebooks. There was no functional change in the teaching and learning process as both teachers and students agreed that Chromebook tools for collaboration were not employed.

**Opportunities for effective application of technology.** Students’ opportunities to apply technology effectively to gain knowledge, develop skills and understand 21st century technology skills were measured through the following aspects: Proficiency level, blended learning and the use of Chromebooks in the completion of independent class-related tasks in school or at home. Findings revealed that 60% of parents labeled their children’s proficiency level in the use of Chromebook computers as advanced. On the contrary, 50% of students rated their proficiency level to be intermediate. A low percentage of parents rated their child at a basic proficiency level, this was also true for
student when they were asked to rate their proficiency level. The data indicates that parents and students feel confident in the skills that Chromebooks have afforded students at SMS and SHS in the use of technology.

Having an opportunity to showcase their knowledge, skills and understanding of the 21st century is paramount in the technology integration process. Findings revealed that the use of Chromebooks for blended learning was a significant trend at SMS and SHS as 56% of teachers indicated that the content of their course was available online. In terms of opportunities for students to apply technology, findings consistently revealed that students were limited to using Chromebooks for assessments and to turn in assignments through Google classroom. A little over a third of teachers (37%) chose the aforementioned tasks as their primary top-rated activities. Additionally, 93% of students were able to complete online assessments without any difficulty, which is consistent with teachers’ selected activity in the use of technology in the classroom.

A large portion of parents agreed that Chromebooks were most often used to complete homework at home. The second most often selected student use of Chromebook computers at home, according to parents, was to communicate with teachers through email. Findings also revealed that the least often students’ use of Chromebooks corresponded with the use of PowerSchool to check grades followed by non-school related online activities such as Facebook, YouTube or other personal use of the Chromebook for entertainment according to parents.

The characteristics of the learning environment at SMS and SHS as it pertains to the effective application of technology to gain knowledge, develop skills and understand 21st century technology fell under the category of active learning, which corresponds with the active adoption of the technology integration levels described by the Technology
Integration Matrix. While findings revealed that there were opportunities for blended learning, the use of Chromebooks for assessments purposes or simply to upload and download information from Google Classroom were consistently identified by parents, teachers and students as the most prominent use of the device inside and outside of the classroom.

**Conclusion**

The use of technology in classrooms is rapidly changing the way teaching and learning take place in the classroom. School district’s efforts to maximize resources to give students a chance to broaden their perspectives in the use of technology have now become a priority, and they must be evaluated to enrich current practices and optimize opportunities as programs are reinvented, redesigned and implemented. The One-to-one Chromebook initiative implemented in the Summerville County Public School System has definitely made progress, and it has brought about change in this school district. In reference to the first evaluation question, it can be concluded that stakeholders at large perceived that implementing the One-to-one Chromebook initiative in this school district had a positive impact in the teaching and learning process.

The lack of resources presented a challenge in the implementation of this initiative, as expressed by members of the technology integration team, administrators, and teachers. Cole and Sauers (2018) posited that a shared vision is the key to success in implementing One-to-one technology initiatives as all stakeholders can offer perspectives and ideas to sustain the goals of the program. The One-to-one initiative at SMS and SHS gained momentum through the implementation stage, and it is viewed as a beneficial tool for students in the school system.
Using the evaluation criteria from the TIM rubric, it can be concluded that both the technology integration level of the One-to-one Chromebook initiative at SMS and SHS, and the learning environment moved simultaneously from an entry level to an adoption level during the implementation stage of the program. In reference to the second evaluation question, the classification obtained from the TIM rubric denotes that core instructional practices at SMS and SHS demonstrate that student engagement in the meaningful curricular content through the purposeful and effective use of technology is mainly limited to the use of the Chromebook device for assessment purposes and as a platform to make resources accessible to students.

Finally, in response to the third evaluation question, the Chromebook initiative afforded students the opportunity to use technology to gain knowledge and develop skills as teachers have provided students with opportunities to interact with the Google classroom platform as a way to submit their assignments and navigate through resources in and outside of the classroom. Additionally, students have the ability to complete assessments without difficulty, and their current use of Google applications to complete individual assignments has improved. It is worth noting that the data collected in this study did not find collaboration among students to complete assignments to be an aspect highlighted through the implementation of this initiative.

**Recommendations**

The value of technology in education has challenged school systems to explore multiple ways to acquire new technology to create meaningful and productive learning experiences in the life of today’s students. However, this study provides information to school systems that should be carefully considered before implementing an initiative such as a One-to-one computer program. First, all programs must bring about instructional
chance in the system, and they must be the result of a shared vision to sustain the
program and ensure its effectiveness. The implementation of the One-to-one
Chromebook Initiative in the SCPS system must be redesigned in the values and best
interest of the community at large. Essentially, all stakeholders must come to a consensus
as of how access to a personal computing device should fit into the profile of a student
that is enrolled in this school district.

Secondly, the findings of this study suggest that technology initiatives should be
designed on the basis of a concrete implementation plan that includes functional activities
that can be easily assessed when reflecting on the effect of the program in the teaching
and learning process. In other words, having goals does not in itself promotes the
effective use of a device nor how to employ the skills that are developed through the
effective use of computers in classrooms. Teachers and students must have concrete
examples of how to showcase and meet the expectations set forth in the goals of the
program. The technology integration team along with the school administration must set
forth guidelines that will define the role of Chromebooks in classroom, supported by
ongoing professional development that prepare teachers to meet the needs of students and
utilize 21st century technology more proactively.

Finally, it is imperative for the school system to engage in ongoing diagnostic and
formative assessments of the initiative throughout the implementation stage, so that
schools can adjust and create teaching routines that are more in line with the demands of
the program. Regarding the Chromebook initiative in the Summerville County Public
School system, the technology integration team should be reorganized to include
additional members such as school principals, teachers, students, parents and business
owners to work with a specific educational level to maximize the instructional aspects of
the initiative. It will be necessary to allow the new redesigned technology integration team to develop strategies to determine whether goals have been reached or not, and a plan of action to create adjustments as the initiative advances to subsequent levels of implementation.

Some of those adjustments that are needed in the new plan of action includes the standardization of technology-related project-based learning experiences in all grade levels in which students have access to their own computing device, to demonstrate their use of technology as a performance task at the end of each semester. Additionally, the school division administration along with the technology integration team should encourage the use of technology in the classrooms by requiring a technology-related SMART goal to include in the teacher evaluation binders at the end of the school year, in such a way that teacher’s individual goals become the moving force of additional improvements that solidify the future of this program in this school district.
References


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Appendix A

ISTE Standard

EXPLORE THE EDUCATOR STANDARDS

1. Learner
   Educators continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning. Educators:

2. Leader
   Educators seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Educators:

3. Citizen
   Educators inspire students to positively contribute to and responsibly participate in the digital world. Educators:

4. Collaborator
   Educators dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Educators:

5. Designer
   Educators design authentic, learner-driven activities and environments that recognize and accommodate learner variability. Educators:

6. Facilitator
   Educators facilitate learning with technology to support student achievement of the ISTE Standards for Students. Educators:

7. Analyst
   Educators understand and use data to drive their instruction and support students in achieving their learning goals. Educators:

EXPLORE THE STUDENT STANDARDS

1. Empowered Learner
   Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.

2. Digital Citizen
   Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.

3. Knowledge Constructor
   Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.

4. Innovative Designer
   Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

5. Computational Thinker
   Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

6. Creative Communicator
   Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.

7. Global Collaborator
   Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
Appendix B

Chromebook Computer Initiative – School Administrator Survey

Survey Consent Form

One-to-one Chromebook Initiative at a Rural School District in Virginia

The purpose of this study is to explore the benefits and potential problems with the One-to-one Chromebook Initiative in our school district. The benefit of my participation is that the school district will gain knowledge that will have the potential to enhance the One-to-one Chromebook Initiative. Your participation in this study is voluntary and should take a total of about 10-15 minutes to complete a survey.

Your responses will be anonymous, and your name will not be associated with any results of this study. You may refuse to answer any questions asked and that you may discontinue participation at any time. There are no known risks associated with the completion of this survey.

If you have any questions in regard to this project, please contact the researcher Juvenal Abrego at 804-929-1704. You may report dissatisfaction with any aspect of this study to the chair of the Protection of Human Subjects Committee, Dr. Tom Ward, 757-221-2358 or tjward@wm.edu.

Your completion of the online survey signifies your informed consent. Click on the link below to begin the survey.

------------------------------------------------------------------------------------------------------------

1. How would you describe your proficiency with the use of technology for instructional purposes?
   - [ ] Advanced
   - [ ] Intermediate
   - [ ] Basic

2. How would you describe your proficiency with Chromebooks?
3. How satisfied were you with the training you received on the use of Chromebook computers?
   - [ ] Extremely satisfied
   - [ ] Moderately satisfied
   - [ ] Neither satisfied or dissatisfied
   - [ ] Slightly dissatisfied
   - [ ] Extremely dissatisfied
   - [ ] Training was not provided.

4. How familiar are you with the goals and vision included in the 2015 – 2018 addendum to the technology plan of your school district?
   - [ ] Very familiar
   - [ ] Somehow familiar
   - [ ] Not familiar at all

5. How do you promote the use of Chromebooks as an instructional tool in your role as a school administrator? Check all that apply.
   - [ ] Provide professional development and training opportunities for teachers.
   - [ ] Use post-observation conferences to share strategies/ideas for teachers to employ in their classrooms.
   - [ ] Use Google classroom as a platform for faculty and staff to collaborate.
   - [ ] Model examples of how to integrate Chromebooks in the classroom during faculty meetings.
   - [ ] My leadership role does not afford me the opportunity to promote the use of Chromebook computers as an instructional tool.

6. What are three of the most valuable opportunities that you have provided the teachers and staff to improve their skills in the use of Chromebooks?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
7. Check the statements with which you agree with regard to the impact of the use of Chromebook computers in your school district. Select all that apply.

☐ Enhance the delivery of instruction.

☐ Provides opportunity for various modalities for assessments.

☐ Provides opportunity for various modalities in the delivery of instruction.

☐ Minimizes classroom disruptions.

☐ Improves student academic performance.

☐ Maximizes online learning opportunities for students in the classroom.

☐ Allows teachers to provide students with immediate feedback.

☐ Distracts students during instructional time.

☐ Gives students too many options for dishonesty in completing their work.

☐ Provides students and teachers with an additional source of communication.

☐ Stimulates students’ critical thinking skills through research-based learning activities.
Appendix C

Chromebook Computer Initiative - Teacher Survey

Survey Consent Form

One-to-one Chromebook Initiative at a Rural School District in Virginia

The purpose of this study is to explore the benefits and potential problems with the One-to-one Chromebook Initiative in our school district. The benefit of my participation is that the school district will gain knowledge that will have the potential to enhance the One-to-one Chromebook Initiative. Your participation in this study is voluntary and should take a total of about 10-15 minutes to complete a survey.

Your responses will be anonymous, and your name will not be associated with any results of this study. You may refuse to answer any questions asked and that you may discontinue participation at any time. There are no known risks associated with the completion of this survey.

If you have any questions in regard to this project, please contact the researcher Juvenal Abrego at 804-929-1704. You may report dissatisfaction with any aspect of this study to the chair of the Protection of Human Subjects Committee, Dr. Tom Ward, 757-221-2358 or tjward@wm.edu.

Your completion of the online survey signifies your informed consent. Click on the link below to begin the survey:

-------------------------------------------------------------------------------------------------------

1. Which subject(s) do you teach?  

2. Which grade levels do you teach? Check all that apply.  

   □ 5    □ 6    □ 9    □ 10
3. How would you describe your proficiency with technology to support student learning and for personal productivity in the management of your class?

☐ Advanced ☐ Intermediate ☐ Basic

4. Rate your school district’s professional development efforts to support you in the integration of Chromebook computers for instructional purposes in your classroom and explain your selection?

☐ Excellent ☐ Good ☐ Fair ☐ Poor ☐ No training

5. How often do you request support from your ITRT to enhance your use of Chromebook computers for instructional purposes in your classroom?

☐ Daily ☐ Once a week ☐ Twice a week

☐ Once a month ☐ Twice a month ☐ Upon request. Please, explain.

6. How familiar are you with the goals and vision included in the 2015 – 2018 addendum to the technology plan of your school district?

☐ Very familiar ☐ Somewhat familiar ☐ Not familiar at all

7. How often do you use Chromebooks for instructional purposes in your class?

☐ Everyday ☐ Typically several times per week

☐ Typically, once a week ☐ Typically, twice a week

☐ At least once a month ☐ Seldom or Never

8. For what purpose do your students use Chromebook computers in your class?
(Check all that apply)

☐ Assessment  ☐ E-mail  ☐ To take notes

☐ Homework  ☐ Google classroom  ☐ Practice activities

☐ To read books online  ☐ Spreadsheets  ☐ Google Hangout

☐ Video recording  ☐ Games  ☐ Charts

☐ Google Docs to prepare reports and individual writing activities.

☐ Google Slides to prepare individual presentations.

☐ Blended learning (At least 40% of the content of your courses is presented online with direct instruction delivered in the classroom)

☐ Google Docs to collaborate with a classmate in written assignments; each student has access to a computing device.

☐ Google Slides to prepare group presentations, working in collaboration and simultaneously with other classmates. Each student has access to a computing device.

☐ To access the content of their textbooks and practice activities online.

9. Is the content of your class available online? If yes, describe the content.

☐ Yes  ☐ No

__________________________________________________________________

10. Do you have coaching opportunities on how to use Chromebooks to improve your instructional practices?

☐ Yes  ☐ No

11. Check the statements with which you agree with regard to the impact of the use of Chromebook computers in your classroom. Select more than one if applicable.
Enhance the delivery of instruction.

Provides opportunity for various modalities for assessments.

Provides opportunity for various modalities in the delivery of instruction.

Minimizes classroom disruptions.

Improves student academic performance.

Maximizes online learning opportunities for students in the classroom.

Allows teachers to provide students with immediate feedback.

Distracts students during instructional time.

Gives students too many options for dishonesty in completing their work.

Provides students and teachers with an additional source of communication.

Stimulates students’ critical thinking skills through research-based learning activities.

12. How do your students demonstrate their ability to effectively use Chromebooks to showcase their understanding of the lesson or topics discussed in your class?

Use Google applications to create presentations, reports, etc.

Complete online assessments in the classroom, guided by the teacher.

Complete assessments or homework activities online independently without direct guidance from the teacher.

Download homework or handouts.

Upload class assignments to their Google classroom or any other learning platform.

Use Google hangout or any other form of virtual interaction to participate in distance learning.
☐ E-mail late assignments, questions, concerns about the class using appropriate conventions for electronic communication.

☐ Other, explain:
Appendix D

Chromebook Computer Initiative – Parent Survey

Survey Consent Form

One-to-one Chromebook Initiative at a Rural School District in Virginia

The purpose of this study is to explore the benefits and potential problems with the One-to-one Chromebook Initiative in our school district. The benefit of my participation is that the school district will gain knowledge that will have the potential to enhance the One-to-one Chromebook Initiative. Your participation in this study is voluntary and should take a total of about 10-15 minutes to complete a survey.

Your responses will be anonymous, and your name will not be associated with any results of this study. You may refuse to answer any questions asked and that you may discontinue participation at any time. There are no known risks associated with the completion of this survey.

If you have any questions in regard to this project, please contact the researcher Juvenal Abrego at 804-929-1704. You may report dissatisfaction with any aspect of this study to the chair of the Protection of Human Subjects Committee, Dr. Tom Ward, 757-221-2358 or tjward@wm.edu.

Your completion of the online survey signifies your informed consent. Click on the link below to begin the survey:

------------------------------------------------------------------------------------------------------------

1. Indicate your child grade level.

☐ 5    ☐ 6    ☐ 9    ☐ 10
2. Read the descriptors below to indicate your son or daughter’s proficiency levels on the use of Chromebooks.

**Advanced:** Uses the device without any assistance. Can assist others. Chooses and uses applications appropriately to complete any given task.

**Intermediate:** Requires some assistance. Completes any given task, employing the appropriate applications. Cannot assist others.

**Basic:** Can turn on the device, send e-mails and search for information on the web. Lack knowledge to use the appropriate applications to complete a task.

☐ Advanced  ☐ Intermediate  ☐ Basic

3. What is your perception of the Chromebook initiative? Check all that apply.

☐ It has helped my child improve his/her academic performance.

☐ It supports my child’s effort to complete school related work at home.

☐ It has become a disruption for my child.

☐ Due to financial hardship, we were unable to secure a Chromebook this year.

☐ I feel confident that with the introduction of the Chromebooks, my child has new skills to succeed in postsecondary education.

☐ Other, explain:

_________________________________________________________________
_________________________________________________________________

4. Rate the following areas in order from 1 to 10, 1 being the most often, to indicate your child’s use of the Chromebook computer at home.

_____ Completion of homework.

_____ E-mail communication with teachers.

_____ Virtual lessons and for the completion of online modules.
_____ To create PowerPoint presentations.
_____ To collaborate with classmates on Google Hangout.
_____ Facebook, Online Games, YouTube.
_____ To find resources to support learning experiences.
_____ For research purposes.
_____ To type papers on Google documents.
_____ To check grades on PowerSchool.

5. Which device does your child appear to prefer when completing school assignments?

☐ Cellphones  ☐ Chromebooks  ☐ iPad

6. Do you find the Chromebook computer to be a beneficial tool for your child’s learning?

☐ Yes, explain.  ☐ No, explain.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Appendix E

Chromebook Computer Use - Parent Consent Form

Dear Parent/Guardian:

Your child is being asked to complete a survey as part of a program evaluation to explore the benefits and potential problems with the One-to-one Chromebook Initiative in our school district. The benefit of your child’s participation is that the school district will gain knowledge that will have the potential to enhance the One-to-one Chromebook Initiative. The survey is attached to this form for your review.

Your child’s participation is voluntary and should take a total of 10 minutes to complete the survey. The information shared in the survey is anonymous, meaning that information about the identity of who complete each survey will not be collected. Your child will be informed that they may refuse to answer any question asked and that they may discontinue participation at any time. There are no known risks associated with the completion of this survey. Only those students whose parents are given written permission by signing this form will be allowed to participate. Those who participate will be eligible for a drawing for gift cards and movie tickets.

If you have any questions in regard to this project, please contact the research Juvenal Abrego at 804-929-1704. You may report dissatisfaction with any aspect of this study to the Chair of the Protection of Human Subjects Committee, Dr. Tom Ward, 757-221-2358 or tjward@wm.edu.

I, __________________________, parent/guardian of __________________ give my son/daughter permission to complete the survey and provide the researcher with honest answers to the best of his or her ability. I understand the data will be analyzed and reported as part of a dissertation for a doctoral degree. I authorize the evaluator, Juvenal
Abrego-Meneses, to use the information that will provided through the completion of the survey.
Appendix F.

Chromebook Computer Use - Student Survey

3. Indicate your grade level.
   □ 5  □ 6  □ 9  □ 10

4. Describe your level of expertise with your use of Chromebook computers.
   □ Advanced (I can use all Google applications without any support)
   □ Intermediate (I feel comfortable using Google Apps with some support).
   □ Basic (I often need a lot of support to complete a task on my Chromebook).

5. Did your school provide you with training on how to use your Chromebook computers?
   □ Yes  □ No

6. In order from 1 to 8, one being the most frequent, in which subjects do you use the Chromebook computer for learning purposes most often?
   ______ English
   ______ Social Studies (US & Virginia History, World History I & II)
   ______ Math (Geometry, Algebra I & II, Statistics)
   ______ Science (Earth Science, Biology, Chemistry)
   ______ Foreign languages (French and/or Spanish)
   ______ Fine Arts (Art, Music, Band, Chorus, Choir)
   ______ Health and PE
   ______ Agriculture

7. Do you find Chromebooks to add value to your learning experiences?
   □ Yes, explain.  □ No, explain.
8. Is your Chromebook helpful to you when completing assignments at home?

☐ Yes, explain. ☐ Somewhat, explain ☐ No, explain.

9. How often do you use your Chromebook to work on school assignments at home?

☐ Everyday ☐ Twice a week ☐ Three times a week
☐ Four times a week ☐ On the weekend ☐ Only if required
☐ Only for core classes ☐ Never ☐ Other, explain

10. Which device would you prefer to use to work on your school assignments?

☐ Cellphones ☐ Chromebooks ☐ Desktop Computers
☐ iPad ☐ I have no preference ☐ Other, explain.
Appendix G

Interview Questions for Technology Committee Members

Informed Consent

The purpose of this study is to explore the benefits and potential problems with the One-to-one Chromebook Initiative in our school district. The benefit of my participation is that the school district will gain knowledge that will have the potential to enhance the One-to-one Chromebook Initiative. Your participation in this study is voluntary and should take a total of about 45-60 minutes to participate in an interview.

Your responses will be confidential, and your name will not be associated with any results of this study. You may refuse to answer any questions asked and that you may discontinue participation at any time. There are no known risks associated with the completion of this survey.

If you have any questions in regard to this project, please contact the researcher Juvenal Abrego at 804-929-1704. You may report dissatisfaction with any aspect of this study to the chair of the Protection of Human Subjects Committee, Dr. Tom Ward, 757-221-2358 or tjward@wm.edu.

- Termination of participation: Participation may be terminated by the experiment if it is deemed that the participant is unable to perform the tasks presented.
- Questions or concerns regarding participation in this research should be directed to Dr. Tom Ward 757-221-2339 at the College of William and Mary – School of Education, Williamsburg, VA.
- I am aware that I must be at least 18 years of age to participate in this project or have the permission of my parent or guardian.
• I agree to participate in this study and have read all the information provided on this form.

Date: __________________ Signature: __________________ Print Name: ____________________

THIS PROJECT WAS APPROVED BY THE COLLEGE OF WILLIAM AND MARY PROTECTION OF HUMAN SUBJECT COMMITTEE (Phone: 757-221-3966) ON (INSERT DATE). (INSERT PROTOCOL NUMBER HERE) If you have any questions in regard to this project, please contact me: Juvenal Abrego at 804-929-1704.

1. What is the nature of involvement in the implementation of the Chromebook computer initiative?

2. Describe in your own words the goals of the Chromebook initiatives proposed in the addendum of the 2015 – 2018 district’s technology plan.

3. What do you view as the strengths of the implementation of the One-to-one Chromebook initiative in your school district as of this date?

4. What challenges can you identify in the implementation of the One-to-one Chromebook initiative at this point?

5. How comfortable do you feel in providing teachers with assistance in using Chromebook computers for instructional purposes in the classroom? Please, explain your answer.

6. What type of training have you received to lead the effective implementation of the Chromebook initiative through your role in the process?

7. Based on your current views of the One-to-one Chromebook initiative in your school district, what adjustment would you make to the program, and why?
8. How is your district assessing the implementation of the Chromebook computer in the middle and high school levels?

9. What instances of student engagement in the use of Chromebook computers at the middle and high school levels have you gathered since the implementation of the initiative?
## Appendix H

### Table of Specifications

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Survey Items</th>
<th>Goals</th>
</tr>
</thead>
</table>
| 1. What is the perception of stakeholders with regard to the Chromebook initiative in this school district? | *Administrator Survey:* Questions 7
*Teacher Survey:* Questions 11
*Parent Survey:* Questions 3 and 6
*Student Survey:* Questions 5 and 6
*Interview:* Questions 3 and 4 | N/A                                                                                           |
| 2. How do core instructional practices at SMS and SHS demonstrate student engagement in meaningful curricular content through the purposeful and effective use of technology? | *Administrator Survey:* Questions 5 and 6
*Teacher Survey:* Questions 7 and 8
*Student Survey:* 4, 8 and 9 | Goal 2: Engage students in meaningful curricular content through the purposeful and effective use of technology. |
| 3. To what extent has the Chromebook initiative afforded students the opportunity to apply technology effectively to gain knowledge, develop skills and demonstrate understanding of technology in the 21st century? | *Teacher Survey:* Questions 9 and 12
*Parent Survey:* Questions 2 and 4
*Student Survey:* Questions 2, 7 and 10
*Interview:* Questions 10 | Goal 3: Afford students with opportunities to apply technology effectively to gain knowledge, develop skills, and create and distribute artifacts that reflect their understandings. |
Appendix I

Technology Integration Matrix
VITA

Juvenal E. Abrego-Meneses


Education Specialist Degree, Major: k-12 School Administration and Supervision – Virginia Polytechnic Institute and State University; Blacksburg, VA (2015)

Master of Arts, Major: English Education and Writing – Longwood University; Farmville, VA (2010)


Bachelor of Arts, Major: Bilingual Education – National University of Panamá; Santiago, Republic of Panamá (2001)