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Improving Technology Integration In A Rural High School By Listening To Students' Needs And Experiences

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IMPROVING TECHNOLOGY INTEGRATION IN RURAL HIGH SCHOOL BY LISTENING TO STUDENTS' NEEDS AND EXPERIENCES

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Abstract

While schools have embraced the mantra of 21st century skills since the early 1990s and access to technology has become nearly ubiquitous, technology use in K-12 classrooms is still largely absent. This has created a situation where teachers are unsure of how to teach with technology and students are unsure how to learn with technology. This transformative mixed methods study sought to give students a voice to articulate their learning needs in relation to technology integration in schools. The study drew on rural high school students' perceptions of technology use in K-12 classrooms by documenting students' use of technology at school and at home, their use of 1:1 devices as a learning tool, and their perceptions of their own academic learning needs when using technology in the classroom. Data was collected through distribution of a survey and through student focus groups. Results indicate that students are not only capable of articulating their needs but have valuable observations about teaching and learning with technology. The student participants in this study noted difficulty with using technology absent of instruction or training, frustration using of technology resources that reinforced incorrect practice of skills, infrastructure and filtering obstacles that prevented independent learning, among other issues impacting their learning. Their observations were translated into recommendations for schools seeking to implement technology in the classroom including providing teachers with a framework for evaluating technology use, developing training

programs for students, and addressing barriers such as connectivity and filtering issues that frustrate students and minimize their enthusiasm for technology use in the classroom.

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CHAPTER 1

INTRODUCTION

Technology has dramatically changed the way many industries operate, from the online sale of books and music to advances in medicine to the tracking and collection of criminal activity in large nation-wide databases. Yet, despite these advances in technology, there is general agreement that teachers often fail to capitalize on available technology resources and use them in pedagogically significant ways. Rather than use electronic devices as powerful tools for learning, student cell phones, laptops, and tablets are often treated as a nuisance that must be controlled or even banned all together (Grant, Tamim, Brown, Sweeney, & Ferguson, 2015). This response may be due in part to classrooms operating in the traditional industrial-model framework where all students are taught the same content at the same time in the same way, moving through grade levels as if they were products on an assembly line. Even though technology can accelerate learning with minimal costs (Fullan, 2013), classroom technology use is often conspicuously absent or used ad-hoc at best. While there is agreement that teachers have access to technology, whether it be through student personally owned or district purchased devices, they still fail to integrate technology into their teaching in ways that enhance student learning (Liu, Tsai, & Huang, 2015). This has led to a wealth of research on the barriers to meaningful technology integration.

As mentioned previously, the barriers to classroom technology integration are well documented. These include time, access to resources, knowledge, and access to quality professional development (An & Reigeluth, 2011). Given that the instructional technology barriers for teachers are well understood, the next step is understanding the barriers students encounter in relation to learning with technology. Thus, students' perceptions, needs, and experiences with technology integration must be understood. Doing so provides students a voice and the opportunity to co-develop technology-based instructional strategies that meet their learning needs. Students can only use this voice if teachers are willing to listen and provide a real-world context for collaboration with their students (Quaglia & Corso, 2013).

Student voice, as a means of incorporating the ideas of young people into the delivery of a modern educational model, has emerged over the last 20 years (Bron & Veugelers, 2014). Generally, it encompasses a range of meanings, from expression of views verbally or non-verbally, to active participation in school-wide decision making (Messiou & Hope, 2016). The literature suggests that while students view classroom and school decisions in different ways than adults and can offer insightful perspectives, rarely are they asked to voice their insights about teaching and learning and, specifically, about the use of technology (Messiou & Hope, 2016). This is perplexing because, while there is a general assumption that students are avid consumers of digital technology and want to use these tools for learning, there is a significant lack of research regarding the tools and pedagogical strategies that work best for their learning (Xiaoqing, Zhu, & Guo, 2013).

This research study documented students' perceptions of technology use in the classroom and their needs in relation to using devices for learning so their insights may better inform instruction. If administrators and teachers have explicit information about students' learning preferences in relation to device usage in the classroom, they can design professional learning experiences for teachers that provide the knowledge and skills necessary to implement technology-based lessons that are relevant and meaningful to students. This work, in turn, may help students develop their technology skills, so that they can be active in the global economy that has emerged alongside the advancement of technology.

Statement of the Problem

Despite the fact that technology is not well-utilized in K-12 classrooms, students are expected to graduate prepared to function in global, high-tech industries. As Hughes, Read, Jones, and Mahometa (2015) pointed out, Internet technologies are constantly changing how we interact with the world. Specifically, they noted five areas in which the Internet is used for social interaction and engagement with the world: political, civic, personal, economic, and educational. Access to this "participatory culture," requires digital media tools and the use of Web 2.0 technologies. However, most technology use by adolescents occurs primarily outside of the school setting (Hughes et al., 2015). While schools have embraced the mantra of "21st century skills" since the early 90s and access to technology has become nearly ubiquitous, technology use in classrooms is largely absent (Fullan, 2013). Thus, there is a stark contrast between the expectation of technology use in the post-secondary world and the reality of technology use in our public schools.

Even when students are exposed to technology within the classroom, research shows that they are exposed primarily to Internet research. Few have opportunities to design, create, write, and share Internet-based technologies in school (Hughes, et al., 2015). Students simply are not engaged in the experiences at school that are necessary for them to be successful in a 21st century global society as defined by the International Society for Technology in Education (ISTE), the leading organization on technology standards for students, teachers, and administrators. In the 2016 ISTE Standards for Students, students are expected to leverage technology to take an active role in their learning by critically curating a variety of resources and digital tools, understanding their rights and responsibilities when using those tools, leverage technology to solve problems, and use digital tools to broaden their perspectives. A graphic displaying the seven ISTE standards for students is included in Figure 1.1.

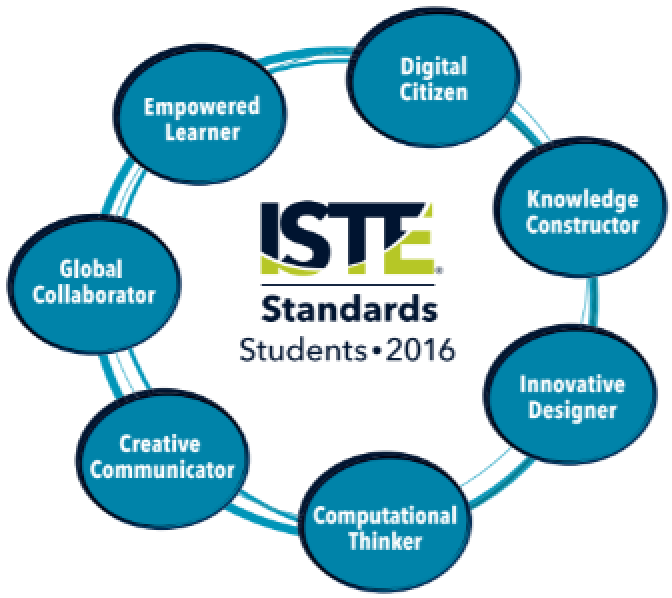


Figure 1.1. Iste standards for students, 2016.

Students are not exposed to the tools and skills necessary to thrive in a digital environment, there is little understanding on the part of educators regarding the types of support students need to have meaningful learning experiences with technology (Philip & Garcia, 2015). Thus, it is critical that educators engage in meaningful dialogue with students to identify and understand students' learning needs in relation to educational technology. Creating ongoing dialogue will provide the information necessary to design professional learning experiences for teachers that not only help them integrate technology into their daily instruction, but also helps them do so in a way that is meaningful and adequately prepares students for the future.

Outside of the specific role of technology in the classroom, policies in the U.S. often inhibit student participation in the development of their learning goals while other nations mandate youth participation. The United Nations adopted a policy in 1989, titled the Convention of Rights of the Child (CRC), that defined youth participation as a series of rights with the intention of bolstering the capacity of young people. To date, the United States is the only country that has not adopted the CRC. Instead, the U.S. remains focused on a system of standardized assessment and accountability that gives students no voice in the development of their learning goals (Mitra, Serriere, & Kirshner, 2014). The result has been the development of an educational system that does not value students' voices in relation to their own learning. As student voice relates to technology, many teachers do not know how to teach with it and many students do not know how to learn with it. Weston and Bain (2010) were keen to note that most educational initiatives fail to change teaching and learning. It is not surprising then, that teachers would struggle with the implementation of instructional technology. Thus, the challenges of researching teaching and learning with technology become compounded by the fact that researchers are only collecting information from teachers and largely ignoring the voices of students. There is very little documentation on how students learn with technology in and out of school or what types of support they need to be successful in their learning.

Purpose of Study

The purpose of this transformative mixed-methods study is to document students' perceptions of technology use in the classroom, identify their academic learning needs and preferred methods of instruction, and extrapolate that information to inform classroom instruction. Current literature on student voice legitimizes the process of collecting student input and suggests that students can offer alternative perspectives to that of adults and can help practitioners learn more about their own successes and failures. However, when students are asked to share their experiences, they are often asked about ancillary issues such as the physical environment or school culture. Rarely are students asked about teaching and learning (Messiou. & Hope, 2016). This oversight prevents the acquisition of a true understanding of students' preferences and needs when learning with technology.

Because successful engagement in nearly all aspects of society (information consumption, communication, social and political engagement) now requires citizens to be adept in the use of Internet technologies (Hughes, et al., 2015), it has become more important than ever for teachers to successfully integrate technology in the classroom. This realization has led to a burgeoning movement in Central Pennsylvania to provide students' access to devices in a one-to-one environment. One-to-one (1:1) is defined as each student having an electronic device (laptop, tablet, Chromebook, etc.) that they keep with them at all times, both at school and at home. While this presents a positive shift in addressing the digital divide, much research suggests that such devices are often used as simple research tools, akin to a paper encyclopedia (Hughes et al., 2015). Thus, teachers must be engaged in professional dialogue with students regarding how technology can be leveraged to better support their learning.

While important, student access to devices and professional learning for teachers are not enough. Consideration must be given to students' needs in relation to technology use. How can technology be used as a tool that increases engagement and promotes learning? Students are essential stakeholders to include in answering this question. Mitra, Serriere, and Kirshner, (2014) noted that student participation in decision making helps increase students' levels of civic engagement and feelings that they can make positive differences in their own lives and the lives of others. Additionally, student-voice activities can serve as a catalyst for fostering change in schools, including instruction, curriculum, and student-teacher relationships (Mitra, Serriere, & Kirshner, 2014). Thus, this study aims to examine an important gap in the literature: students' perceptions of learning with technology. To close this gap, students must be given a voice to express their needs in relation to learning with technology. This information must be collected, documented, and analyzed for trends. These trends must then be used as the basis for changing the instructional models utilized in schools.

Research Questions

The overarching question guiding this research is: How can student voice be used to guide technology integration in rural high school classrooms? Specific research questions include:

1. How do rural high school students' use of technology in and outside of the classroom differ?
2. How are students currently using Chromebooks as a learning tool?
3. How do students articulate their academic learning needs in relation to 1:1 device usage in the classroom?

Conceptual Framework

The theoretical framework for this study is grounded in Bourdieu's (1977) sociological theory, "The Theory of Practice." It provides an important framework from which to view the traditional classroom structure in which teachers and students both play their parts. That is, teachers are in front and firmly in charge of what is happening and students are quiet and compliant, willing to do as instructed without complaint (Quaglia & Corso, 2014). This industrial model framework has remained unchanged for over a century. Burridge (2014) noted that the difficulty in achieving change in the balance of power between teachers and students may be due to the intricate nature of schools, which are complex environments of people from different social and cultural backgrounds. He noted that the classroom is only one of many hierarchical environments within a school. Understanding these complex relationships from a sociological perspective, as provided by Bourdieu (1977), may provide insight into how school structures and practice limit certain types of learning environments. It also provides a framework from which to view the subversion to student voice in the classroom.

Schools are organizations made up of groups of people from a cross-section of society for the purpose of teaching and learning. There are many theories regarding the purpose of schooling. Therefore, Bourdieu's theories are important because they provide a framework to examine how social understandings of different groups influence practices within schools (Burridge, 2014). Burridge (2014) described two aspects of Bourdieu's theory that can aptly be applied to technology use in the classroom. First, he described Bourdieu's (1977) concept of cultural capital, which is defined as, "familiarity with the dominant culture in a society" (p. 145). It can be applied to education in that within the current system of public education, there is a greater imbalance of power between teachers and students. This may be due to the lack of work done to assess students' needs and preferences in relation to educational technology. A second concept, habitus, is also important to understanding social practices within schools. Habitus is a system of schemas of perception and discrimination people use to navigate their way through the world (Burridge, 2014). In the context of the educational environment, teachers' preconceived schemas about the value of technology for learning may have significant impacts on their application and use of technology resources for learning.

Pulling these concepts together, a person's capital and habitus translate into their everyday practices. Because different groups of people from different social classes inhabit different social spaces (See Figure 1.2), an imbalance of power often exists within these social spaces. Within schools, it is possible that one group will inadvertently maintain power over other groups through common and accepted social practices (Burridge, 2014). This includes the traditional framework of teacher as authoritarian.

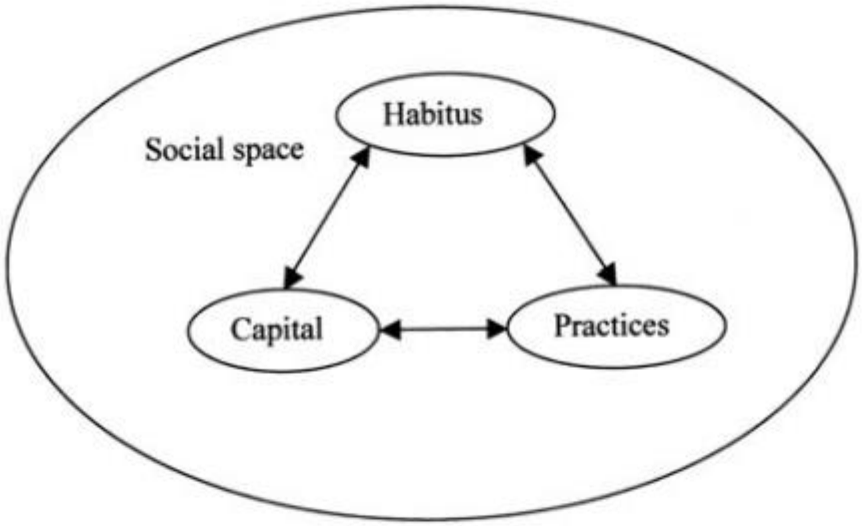


Figure 1.2. Interaction of capital, habitus and practice (Burridge, 2014).

Additionally, it is important to note that the balance of power in students' use of technology is different depending on their location during use. With the exception of any parental controls, students have voice and choice in the ways they use technology outside of school. In some cases, they may be considered early adopters of certain realms of technology, including, but not limited to, gaming, content consumption, and social media. However, they are not experts in curriculum design and may not understand how these technologies can be used for learning. Their role as students is impacted by the social space in which they are interacting because they are treated as persons not capable of understanding their own learning preferences. These concepts provide a valuable lens from which to view the current state of technology integration and how the utilization of student voice may be used to correct the current imbalance of power in the traditional classroom with the goal of improving teaching and learning.

A second important lens through which to view this research study is by examining the brazen assumptions that are often attributed to youth culture and technology. Jonas (2011) carefully examined Dewey's (1896) seminal work on student interest and its place in current pedagogy. Through his study, he concluded that many teachers in teacher preparation programs are introduced to Dewey's "epoch-making" (p. 112) ideas on interest and effort through discussions of child-centered teaching that use student interest as the basis for lesson design. More recent research pulls from Dewey's original ideas, but points out flaws with making assumptions about student interest. Philip and Garcia (2015) write that a number of researchers problematize research on mobile devices and instructional technology with overly optimistic visions of how classrooms might change with these devices in students' hands. They note the pitfalls of educators assuming that youth are uniformly interested in using technology for formal learning purposes. Philip and Garcia (2015) summarized this problem when they wrote, "Discourses that assume the proximal benefits of technology exceedingly focus on the presumed inherent qualities of a device and overlook the role of the teacher in co-constructing classroom contexts for students' situational interests to burgeon into authentic learning pursuits" (p. 680).

This is not a new criticism. Larry Cuban, a well-respected researcher on educational change, wrote a "techno-critique" of 1:1 laptop programs, titled "The Laptop Revolution has no Clothes" that Weston and Bain (2010) used as the basis for their piece on connecting technology with cognitive tools for learning. In their work, they discussed Cuban's criticism of what he deemed outlandish claims in the early 90s that laptop programs would improve teaching and learning. Rather than agree with Cuban's critique, they used their work to propose that schools and teachers struggling with 1:1 programs use six cognitive tools in coordination with their implementation on devices. One of these tools is feedback from all members of the school community, including students. These two concepts, Bourdieu's "Theory of Practice" and critiques of student interest from researchers like Philip and Garcia (2015) and Weston and Bain (2010), converge to inform this study by providing a different lens through which to view student technology use. Together, these concepts provide a framework that allows students to voice their academic learning preferences when using technology in the classroom.

Assumptions, Limitations, and Scope

Assumptions

Within this case study, the researcher makes several assumptions. First, it is assumed the classrooms chosen for this study are representative of the general school population. That is, that the students asked to participate in the study share similar experiences, opinions, and beliefs as other students within the general school population. The researcher will make every attempt to accomplish this through stratified sampling. Students will be identified for the study that are representative of the total school population.

A second assumption is that participants will be truthful in their responses and share relevant information. This assumption is based on the presence of role duality. Coghlan and Brannick (2014) noted that, within a school climate, it can be a significant struggle to maintain a collaborative culture, especially in a school that does not already have a culture of collaboration. Being familiar with particular personalities, perspectives, and dynamics between teachers and students can be a significant strength when conducting research in a familiar organization.

A final assumption is that students will be able to clearly articulate their preferences regarding the use of technology for learning. That is, they will be able to express what they appreciate about the use of devices in their classrooms and that they will be able to discuss what is missing or what they would like to see more of. Messiou and Hope (2015) supported the use of student voice in changing classroom practice. They note a wealth of research suggesting that students can offer insightful perspectives given that the process for collecting such information is well-designed.

Limitations

Due to the qualitative and subjective nature of the study, a limitation is that results may not be generalizable to other high schools. Differences in home environment, past experiences with technology, student-teacher relationships, and general feelings about school may impact students' responses. The researcher will need to look for recurring themes in responses as a means of providing generalizable information.

Scope

There are several items that define the scope of this study. First is the time of the study, which was executed during the months of September and October, 2016. The time was selected purposefully based on several factors. It is during the school year, when students will be accessible during the school day. Additionally, because the program starts in 6^{th} grade, students will have had at least two full years of experience with a 1:1 technology initiative on which to draw from during surveys and focus groups.

The location of the study is a rural school district in central Pennsylvania with a population of less than 3,000 students. Rural is defined using the Federal Communications Commission (FCC) eRate guidelines for rural and urban school classifications. Students must be in grades 9 -12 to participate in the study. This allows the study to be conducted with students who not only have access to devices but can also articulate their thoughts.

Rationale and Significance

The evolution of technology has made its mark on modern industry. However, few public schools have leveraged technology to make innovative changes to their instructional framework (Grundmeyer, 2014). If students are expected to graduate high school with the skills necessary to compete in a highly competitive, technology-driven, participatory global environment, educators have a moral imperative to ensure that students leave their classrooms with the skills necessary to thrive in such an environment (Edwards, 2013). As Hughes et al. (2015) pointed out, inequalities currently exist in how youth access a technology rich and participatory culture both in and out of school and this has the potential to inhibit them from developing crucial digital literacies. As such, district and school leaders have the same imperative to ensure that teachers are equipped with the tools and skills necessary to engage in pedagogically meaningful instruction that meets students' needs and aligns with the needs of an evolving economy. To do this, students and teachers must be able to engage in rich and meaningful dialogue that leads to affirmation of or changes to technology integration in the classroom. This dialogue cannot exist without the presence of student voice. Students must be asked about the impact of 1:1 programs on their learning to determine whether current pedagogy with the devices is successful in promoting learning objectives. Second, students must be able to articulate their needs when using devices in the classroom. What types of training do they need to use technology for learning? Do they even view these devices as tools for learning? Only by asking these questions can we begin to define professional learning experiences for teachers that will adequately prepare them to use electronic devices in the classroom in ways that support new and innovative learning experiences.

Definition of Terms

The following terms and definitions are provided as used within the context of this study.

One-to-One (1:1) - A technology integration program in which every student is provided with a device to use during and outside of the school day (Storz & Hoffman, 2012). Typically, and in the context of this study, all students have the same device. 1:1 initiatives are often deployed in an entire building or several buildings to promote system-wide change. They may also require conditions such as infrastructure upgrades, professional development, and community buy-in to experience success (Krueger, 2014).

Bring-Your-Own-Technology (BYOT) – A technology integration program in which students are encouraged to bring personally owned electronic devices to school for use in the classroom (McClean, 2016).

Chromebook – A laptop that is designed to run web-based applications like Google Drive, rather than traditional applications that reside on the device itself, such as Microsoft Office. Chromebooks are rapidly becoming the device choice for 1:1 programs because of their low cost and ease of maintenance (Fink, 2015).

Professional Learning - Instruction provided to educators in a formal or informal setting (Sheninger, 2013).

Student Voice - Students' expression of views verbally or non-verbally; active participation in classroom or school-wide decision making (Messiou, K. & Hope, M.A., 2012). Within the context of this study, student voice is defined as students' expression of views related to 1:1 device usage in the classroom.

Cultural Capital - Familiarity with the dominant culture in a society (Bourdieu, 1977). Within education, teachers hold an authoritarian cultural capital while students hold a submissive cultural capital (Burridge, 2014).

Habitus - A set of attitudes or beliefs held by a certain class (Bourdieu, 1977). Within the context of this study, habitus are the views and attitudes held by teachers regarding technology. These views may, in large part, be influenced by a teacher's past experiences with technology or experiences learning in classrooms without technology (Belland, 2008).

Social Field – Characterized by the power relationships between groups, individuals, and/or organizations, with the field extending as far as power or influence can be wielded. Within education, this can be extended to the conflicting social fields between teachers and students (Burridge, 2014).

Participatory Culture - The use of Internet technologies to participate and engage with society politically, civically, personally, economically, and educationally (Hughes et al., 2015). Participation in this culture is often also referred to as having "21st century skills."

Web 2.0 - Internet-based technologies that offer user-friendly, technically simple interfaces that position the user to be a reader, writer, contributor, collaborator, and creator. These tools are necessary to participate in a participatory culture (Hughes et al., 2015).

Conclusion

There is little disagreement among scholars that technology plays a vital role in all aspects of society. At the same time, there is general agreement that technology has not made a dramatic impact on the way children are educated in the United States. Despite widespread access, technology has failed to make any noticeable difference to 21st century classrooms (Liu, Tsai, & Huang, 2015). This presents a tremendous deficit for our students as they graduate from schools and enter a digitally-driven workforce that requires engagement with an online participatory culture (Hughes, et al., 2015). Thus, it is critical not only that teachers adopt and use technology in the classroom, but that they also understand the impact it has on learning, especially the 24/7 access to information and online tools that are provided with the implementation of a 1:1 program. However, before significant changes can be made to the way teachers teach and students learn, educators must understand the impact these devices have on students. And, specifically, what students need to make the devices even more impactful. Students understand their learning preferences better than anyone else and it is time to take advantage of the suggestions they have to offer. Failure to do so only perpetuates a traditional educational environment that neither serves students nor prepares them for the future. By collecting information about how students learn best with technology, educators can change the face of professional learning, and, ultimately, change the face of pedagogy in the classroom.

CHAPTER 2

REVIEW OF THE LITERATURE

Technology is rapidly changing the way the world operates in nearly every industry except education. Even though technology has advanced the field of medicine, made the retail market more convenient for shoppers, and enhanced areas such as crime detection, educators continue to operate in an industrialized model where children of similar ages learn the same thing at the same time, regardless of their ability or needs. While technology could be used to drastically change this traditional classroom model to promote greater and more individualized learning experiences, there is general agreement that teachers often fail to capitalize on available technology resources and use them in pedagogically significant ways (Brinkerhoff, 2006; Kopcha, 2012). Teachers' perspectives on the barriers to meaningful technology integration are well documented in the literature. However, what is not well documented are students' perceptions of technology use in the classroom. Few researchers have asked students what barriers they face when using technology for learning. Thus, this literature review explores the problem of technology integration in schools, common barriers to technology integration, 1:1 programs in high school settings, student technology use in context, and student perceptions of the role of technology in their learning.

Technology has dramatically changed the way many industries operate, from the online sale of books and music to advances in medical technology to the tracking and collection of criminal activity in large-nation wide databases (Ertmer & Ottenbreit-Leftwich, 2010). Despite advances in technology, there is general agreement that teachers often fail to capitalize on available technology resources and use them in pedagogically significant ways (Brinkerhoff, 2006). Instead, classrooms continue to operate in the traditional industrial-model framework where students of similar age are taught the same content, at the same time, in largely the same way. What is keeping teachers from using technology to enhance instruction and improve learning in new and innovative ways?

The barriers to meaningful technology integration are well documented in the literature. These include time, access to resources, knowledge, and access to quality professional development (Ertmer & Ottenbreit-Leftwich, 2010; Kopcha, 2012). In addition to these barriers, a complex underlying hierarchical structure governing the power of teachers over students (Burridge, 2014) prevents students from expressing their preferred modes of learning. Given the documentation that technology is not well-utilized in the classroom and that the barriers impeding technology integration are understood, the next step is developing an understanding of students' perceptions, needs, and experiences with technology integration. Specifically, this study focused on rural high school students' experiences with a one-to-one (1:1) Chromebook program. A one-to-one program is one that provides every student with a device that they may keep with them 24 hours a day 7 days a week. The device addressed in this study is a Chromebook, a mobile computing device with a keyboard that runs applications that reside in the cloud, rather than on the device itself, as on traditional laptops. The research questions addressed are:

1. How do rural high school students' use of technology in and outside of the classroom differ?
2. How are students currently using Chromebooks as a learning tool?
3. How do students articulate their academic learning needs in relation to 1:1 device usage in the classroom?

Method of Literature Collection

The underlying purpose of the research study is to determine students' learning needs in relation to 1:1 device usage. Interest in this topic stems from the researcher's experiences with the implementation of a 1:1 Chromebook program in a rural Pennsylvania high school and the instructional and pedagogical needs related to that program. As such, the literature collected for this review included only peer-reviewed journal articles published within the last ten years as well as books focused on student 1:1 experiences, barriers to technology integration, student voice, and other related topics. Key words used to search scholarly databases such as Academic Search Premiere, ERIC, and EBSCO included a combination of the following: technology integration, barriers to technology integration, classrooms, schools, education, student voice, 1:1, classroom technology, etc. Additionally, reference lists from previously read articles were used to identify new resources. The sources that were utilized in this literature review were chosen or discarded based on their relevance to the research questions or because they helped the researcher to develop a more thorough understanding of the underlying barriers to pedagogically meaningful technology integration, trends in 1:1 programs, or the use of student feedback for instructional improvement.

The Problem of Technology Integration in Schools

Technology use, tablets, laptops, smart phones, is growing increasingly prevalent in all facets of our personal and professional lives. Yet, despite widespread access to technology, there is a large subset of research that suggests that technology has yet to significantly impact North American schools. According to Ertmer and Ottenbreit-Leftwich (2010), research from both large and small-scale efforts suggested that schools have not reached high levels of technology use, either in the U.S. or internationally. Hixon and Buckenmeyer (2009) echoed this finding when they wrote, “Despite the abundance of technology in the schools, as well as increasing sophistication, technology has made little impact on the educational process” (p. 130). They noted that new technologies have been paraded through schools, each with the promise of transforming the landscape of education. While administrators and policy makers have assumed that teachers would automatically implement these new tools, technology continues to be underutilized and has failed to make a significant impact on teaching and learning. While teachers are able to use technology for administrative functions such as communicating with parents or peers, preparing teaching materials like lesson plans, or taking attendance, there is a significant gap between the available technology in today’s classrooms and teachers’ ability to use that technology for pedagogically meaningful purposes (Kophca, 2012). Recognizing that a clear disconnect between access to technology and classroom use exists, it is essential to understand the barriers preventing teachers from meaningful technology integration.

Common Barriers to Technology Integration

It is well-documented that teachers often fail to capitalize on available technology to improve student learning experiences. Naturally, the question that follows is, “Why? What are the barriers holding teachers back?” Unfortunately, the barriers are many. To understand why teachers struggle with technology integration, one must first look to their experiences as students. Most in-service teachers, and even pre-service teachers, did not receive their education in technology-rich classroom environments. They have spent hours in classrooms learning how to be taught without technology. Similarly, pre-service teachers are led by teacher mentors and professors who do not use or model technology for learning. Thus, many teachers harbor “folk pedagogies,” which they have acquired through their experiences as children, students, and teachers. Belland (2008) referred to these dispositions as “habitus.” He noted that while teachers may espouse technology integration as beneficial to teaching practice, they often do not have a framework for implementing technology in meaningful ways.

In addition to these preconceived notions (habitus) of what a classroom should look like, several other barriers to technology integration exist. Hixon and Buckenmeyer (2009) categorized these barriers into two groupings: first-order barriers and second-order barriers. First-order barriers, they noted, are external and out of the teacher's control while second order-barriers are internal to the teacher, representing underlying personal beliefs. Table 2 summarizes the first and second-order barriers commonly cited in the literature.

Table 2

Common First-Order and Second-Order Barriers to Technology Integration in Schools

First-Order Barriers	**Second-Order Barriers**
Access – Teachers can feel as if they lack access to technology, even if it is available, because it does not work properly (Kopcha, 2012)	*Habitus* – A teacher's underlying beliefs about the usefulness of technology can influence their decisions regarding whether to use technology for instruction (Belland, 2008 & Kopcha, 2012)
Self/Technical Efficacy – Teachers who do not feel competent in the use of a new tool are less likely to adopt that tool for instruction (DeSantis, 2012 & Ertmer & Ottenbreit-Leftwich, 2010, Pan & Franklin, 2011)	*Knowledge* – To use technology to facilitate student learning, teachers need additional knowledge and skills that build on, and intersect with their knowledge of pedagogy, content, and students (Ertmer & Ottenbreit-Leftwich, 2010)
Time – Teachers have reported that technology integration requires more time (finding resources, dealing with student misbehavior, troubleshooting issues) (Kopcha, 2012 & Storz & Hoffman, 2012)	*Culture* – Technology innovation is less likely to be adopted if it deviates too far from existing values, beliefs, and practices of other teachers and administrators in the building (Ertmer & Ottenbreit-Leftwich, 2010)
Professional Development – Training is cited as a barrier when it lacks connection to classroom practice (Kopcha, 2012)	*Vision* – Teachers with a strong vision for how technology will be used are less likely to abandon its use when they encounter difficulty (Kopcha, 2012)

Hixon and Buckenmeyer (2009) noted that to move beyond the initial developmental stages of technology integration, which include non-use or personal use of technology, the focus of professional development must shift from first-order barriers such as "how to" trainings to second-order barriers such as the technology's relationship to teaching and learning and connection to the curriculum. “Second-order barriers,” they write, “are reinforced and emphasized when first-order barriers become the focus of teacher training” (p. 141).

Beyond these common first and second order barriers lie additional issues when trying to integrate technology in pedagogically meaningful ways. Zyad (2016) identified several barriers in his study on technology integration and teacher attitudes. He noted that the teachers in his study identified a lack of incentive as one of the serious barriers preventing teachers from integrating technology in their daily lessons. Teachers noted that they were not offered any type of encouragement, be it symbolic or material, for their use of technology. These same teachers identified class size as an additional barrier. They noted that a crowded classroom prevents many teachers from trying anything new, whether it be technology related or not, citing classroom management and control issues.

Another often cited barrier to successful technology integration in schools is stakeholder buy-in (Haper & Milman, 2016). While it has already been noted that a teacher’s habitus (Belland, 2008) may play into his or her attitudes regarding the use of technology for instruction, there may also be reluctance on the part of students in relation to technology use in the classroom. In an extensive literature review of 1:1 programs, Harper and Milman (2016) noted that some studies show that older students demonstrate reluctance and resistance to technology use. This may correlate with Grundmeyer’s (2014) assertion that the novelty of 1:1 programs wears off over time and students become less interested in the devices. The identification of student barriers warrants further consideration and supports the collection of student perceptions in relation to classroom technology use.

1:1 Programs Produce Conflicting Results

Since the adoption of 1:1 programs became relatively mainstream in public schools, much research has been conducted regarding the effectiveness of these programs. However, studies on 1:1 programs have produced varying results. Harper and Milman (2016) explored 46 articles on 1:1 device implementation, focusing on achievement, motivation and engagement, and changes to the classroom environment. They found mixed results in relation to achievement. Some studies reported increased achievement in math or reading, but not both. Other studies found no changes in academic achievement following the implementation of a 1:1 program.

While many studies showed increases in motivation and engagement, Harper and Milman (2016) were careful to note that high levels of engagement decrease over time. Again, the suspected culprit is the dissipation of the novelty of the program. This correlates with Gartner's Hype Cycle as described by Grundmeyer (2014). The Hype Cycle (Figure 2.1) is "a predictable shape that defines the mainstream adoption pattern of technologies (Grundmeyer, 2014, p. 209). As with many new technology initiatives, a new tool triggers the implementation and is followed by a peak of inflated expectations. This is often when both students and teachers are most excited about the new tool. Following this peak, the novelty wears off and disillusionment sets in. Sometimes, product upgrades occur, causing a renewed interest in the technology tool (called the slope of enlightenment) and then productivity plateaus. These stages are illustrated in Figure 2.1.

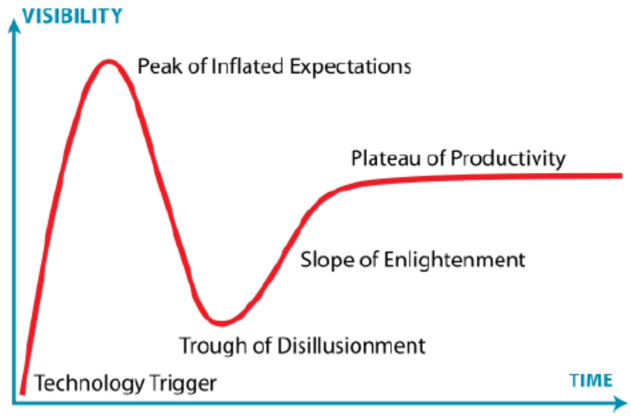


Figure 2.1. Gartner's Hype Cycle

Studies showed that changes to the classroom environment were also inconsistent. In some studies, there were notable changes in teachers' instruction. In these cases, teachers were more inclined to differentiate instruction, allow students to work collaboratively, and employ constructivist pedagogies (Harper & Milman, 2016). However, often the devices were used as a substitute for traditional classroom tools such as an encyclopedia or notebook (Dolan, 2016). If this was the case, classroom instruction was unlikely to change even with the inclusion of electronic devices.

Student Use of Technology

Research regarding student use of technology, both at school and at home, is relatively recent. However, the literature that exists suggests that technology use at home and school are starkly different. A study conducted by Hughes, Read, Jones, and Mahometa (2015) suggested that school-based technology is used primarily for Internet research with few opportunities for creation, design, writing or sharing. Additionally, home use of technology still greatly outweighs school use and is far more media-rich and social. Those students who do not have access to Internet-based technologies at home are therefore at a disadvantage with their peers, getting fewer opportunities to engage in content creation and sharing. This is often known as the “digital divide” and/or “digital disconnect” (Dolan, 2016), or as Hughes et.al. (2015) defined it, “the participation gap.” The existence of a participation gap is disturbing, especially when considering Project Tomorrow’s 2014 Speak Up Survey on “Trends in Digital Learning: Students’ Views on Innovative Classroom Models.” This study reported that while 43% of high school students in virtual schools (schools in which students take courses entirely online) say they are interested in what they are learning, only 32% of all high schoolers in the United States express the same sentiment. A similar disconnect exists when students are asked about their motivation to do well in school. More than one-third (35%) of students enrolled in a virtual school students say they are motivated to do well because they like school. By comparison, only a quarter (26%) of high school enrolled in a brick-and-mortar school felt the same (Project Tomorrow, 2014). The QISA My Voice Survey (2014) validated these findings. They reported that the current, inherited education model may not adequately serve the current generation of learners. Student dissatisfaction, they suggested, is not about specific teachers or classes, but rather more about the underpinnings of an antiquated educational model that does not value student’s own perceptions of their learning.

In their study on the implementation of a 1:1 program with district-purchased mobile phones, Philip and Garcia (2016) found a significant disconnect between adult assumptions of perceived youth interest in using technology for learning and the actual benefits of a 1:1 mobile phone environment. In fact, the student focus groups in the study demonstrated that students came to disdain the devices rather than see them as a useful tool for learning. This was due largely to the policies that were integral to the mobile device program. One such policy included student liability for breaking the device. Students reported that they were afraid of breaking the devices and in many cases left them at home out of fear of losing or damaging the phone. As

Philip and Garcia (2016) pointed out, the fear of liability changed how students engaged with the device, creating a different environment from that in which they interact with their personally-owned cell phones. The enthusiasm of the devices was also lost in the lack of freedom students experienced as a result of school filters and use restrictions. Largely, students felt as though the school phones were a hassle, a limited device with the stressors of liability attached. As a result, some students simply downloaded the application that was specially created for the phones on their own devices and kept the school device at home in a drawer. And yet, while students came to despise the phones in the program, they had valuable feedback for the researchers. They saw potential in mobile phones as creating a social space for learning where students could exchange information quickly. They noted the potential for communicating with other students during instruction and saw potential in the mobile arena for school officials to gather student input with polls and other communication methods. In short, students saw practical ways to improve the classroom experience and new ways of re-shaping their social experiences at school. Philip and Garcia's (2016) work suggested the need for educators to put aside current assumptions about student interest in technology and focus on the feedback that students have to offer.

In addition to the research that demonstrates inconsistencies in the value of 1:1 programs, there is also some research to suggest that students may have experienced difficulty transitioning from the face-to-face traditional classroom environment to the blended environment created by mobile device programs. In a study conducted by Lee, Tsai, Chai, and Koh (2014), the researchers concluded that students' perceptions of their learning goals affect their motivation. However, at the same time, students' perceptions of their learning may differ substantially across the two different contexts (face-to-face and blended environments). These perceptions may, in fact, contradict each other rather than complement each other. They concluded that blended environments, such as those often promised by 1:1 initiatives, empower students only if students are prepared to exhibit 21st century skills such as self-directed learning, collaboration, and critical thinking in the face-to-face environment first. Because of students' differing experiences with technology in the home environment, Hughes, et. al. (2015), recommend that teachers and administrators should know what types of technology students have access to at home so that they can plan classroom activities accordingly.

Given the evidence that the success of 1:1 programs varies from implementation to implementation, it may be time to gather the input of a new stakeholder group. That is, those who are actually expected to learn with the devices, our students.

Embracing Student Voice

There is a wealth of literature on using student voice to increase student motivation and engagement and improve learning. Fullan (1991) asked, "What would happen if we treated the student as someone whose opinion mattered?" (p. 170). Kane and Chimwaynge (2014) echoed this by noting that students can articulate their needs and they have worthwhile things to say, if teachers are open to listening to them. However, student feedback is not always embraced by teachers. They are often hesitant to vest authority in their students (Kane & Chimwaynge, 2014). Teachers have concerns with complex roots that involve questions of identity and purpose. They often fear students will make unrealistic requests or judgments, without considering the consequences of their words (Bragg, 2007). This is a concern "without dialogue as a central element of pedagogy, schools are likely to reproduce the class-based inequities prevalent in modern day society" (Ferguson, Hanreddy, & Draxton, 2011, p. 57). For students' voices to have a true impact on school culture and classroom practice, students must feel a sense of inclusion, validation, and agency. This increases learning engagement and confidence and improves students' skills in cooperation and negotiation while school teachers and staff gain insight and awareness from the perspective of students (Keddie, 2015). Thus, the success of any student voice study is dependent upon a structuring process that allows meaningful contributions from all (Bragg, 2007).

Additionally, there is research to support the use of student feedback in instructional improvement. Nelson, Ysseldyke, and Christ (2015) conducted a study on using student feedback to guide core instruction in the classroom. They found that "student ratings of the classroom environment can offer meaningful and unique insight into the student experience (Nelson, et. al., 2015, p. 17). Within their study, they found that teachers who were given access to student feedback rated higher in subsequent evaluations than teachers who did not receive feedback from students. This supported the idea that student perceptions are a meaningful source of information for classroom improvement.

In relation to technology integration and 1:1 programs, current literature suggested that students have substantial feedback to offer, if they are asked. In Grundmeyer's (2014) study of college students who had participated in a 1:1 program during their high school years, the students interviewed indicated that they had no idea what the purpose of the 1:1 program was. If students are not given explicit instruction on how technology can enhance their learning, how will they know? Additionally, students reported issues with being distracted by the devices, frustration with teachers wasting instructional time because they did not know how to use the devices, and frustration over not knowing what to do with the devices. Their comments suggested a need for student feedback on technology integration programs.

A Gap in the Literature:

The Importance of Student Voice in Studies of Technology Integration

One area poorly represented in the literature is the voice of students in relation to technology use in the classroom. While there is much research on teachers' perceptions of technology and their professional development needs, little research has been done on students' learning experiences with technology (Beckman, Bennett, & Lockyer, 2014). With the increasing prevalence of Bring Your Own Technology (BYOT) and 1:1 programs, students are being required more often to use technology in the classroom. Additionally, there is growing awareness that students must be proficient in the use of Internet technologies as it is systematically changing how the world operates in every realm (socially, politically, economically, civically, and educationally). Students must be part of what Hughes, et. al. (2015) called a "participatory culture" where students develop multi-modal digital literacy skills. However, we know very little about what types of support these students need to make learning experiences with technology successful. Quaglia and Corso (2014) noted that, "In the rush to raise proficiency, performance, and implement 21st century goals, all too often educators neglect the perspective of those who belong squarely in this century and no other – their students" (p. 162). Wright (2015) agreed, pointing out that positive student feedback can be a strong motivational factor for teachers' use of innovative pedagogical practice. This presents a powerful opportunity for shaping teacher's professional learning experiences through student voice. If we are able to determine students' needs in relation to their use of technology in the classroom, we can better target teachers' professional development to meet their needs.

Conceptual Framework

Bourdieu's (1977) sociological theory provides an important framework in which to view rural high school students' experiences with technology within the context of their learning. Sullivan (2012) described two aspects of Bourdieu's theory that can aptly be applied to technology use in the classroom. First, she described Bourdieu's concept of "cultural capital." Cultural capital, according to Bourdieu (1977) is "familiarity with the dominant culture in a society" and can be applied to education in that "the education system presupposes the possession of cultural capital, which few students in fact possess" (p. 145). That is, within the current education system, there is a greater balance of power between teachers and students because little research has been done to assess students' needs and preferences in relation to educational technology (Mutch, 2006). Additionally, Bourdieu presented the concept of "habitus," a set of attitudes held by a certain class (Sullivan, 2012). In the context of the educational environment, teachers' preconceived notions about the value of technology for learning may have significant impacts on their application and use of technology resources for learning. Additionally, one must look through the lens of student interests and the flaws that exist when educators assume that student interest can be transferred from one context to another without losing any of its splendor. These concepts provide a valuable framework from which to examine current state of technology integration and how utilization of student voice may be used to correct the current balance of power and improve learning.

Conclusion

There is a tremendous amount of research suggesting that technology is not well utilized in classrooms. There is a wide breadth of research regarding teacher's perceptions of the barriers to implementation. There is varied research about the value of 1:1 programs. What is lacking in all of this research is the voice of students in framing how technology can be best utilized for instructional purposes. This gap deserves recognition. In order to truly improve students' learning experiences with technology, we must understand and allow them to articulate their needs and preferred learning styles. In doing so, the educational community will be much better equipped to prepare teachers to use technology as a pedagogically meaningful tool that supports instruction and meets students' learning needs.

CHAPTER THREE

METHODOLOGY

The purpose of this research study was to develop a better understanding of students' perceptions and needs in relation to technology use in the classroom. Specifically, the study focused on students' use of Chromebooks in a 1:1 setting. The Chromebook, a laptop-like device running Chrome Operating System (OS) and designed to use only web-based applications, has seen skyrocketing sales in the K-12 market in the last five years, even surpassing sales of the iPad (Fink, 2015). As devices like the Chromebook become more prevalent in public schools, it is important to understand how students can best use these devices for learning. However, given the traditional power construct in our schools, where students are expected to be passive receivers of information while teachers direct the entire classroom experience (Quaglia & Corso, 2014), little information exists on students' learning preferences in relation to technology use. This study sought to determine how student technology use differs based on the context of use (school vs. home) as well as document students' learning experiences in the 1:1 setting.

The overarching question guiding this research was: How can student voice be used to guide technology integration in rural high school classrooms? Related questions included:

1. How do rural high school students' use of technology in and outside of the classroom differ?
2. How are students currently using Chromebooks as a learning tool?
3. How do students articulate their academic learning needs in relation to 1:1 device usage in the classroom?

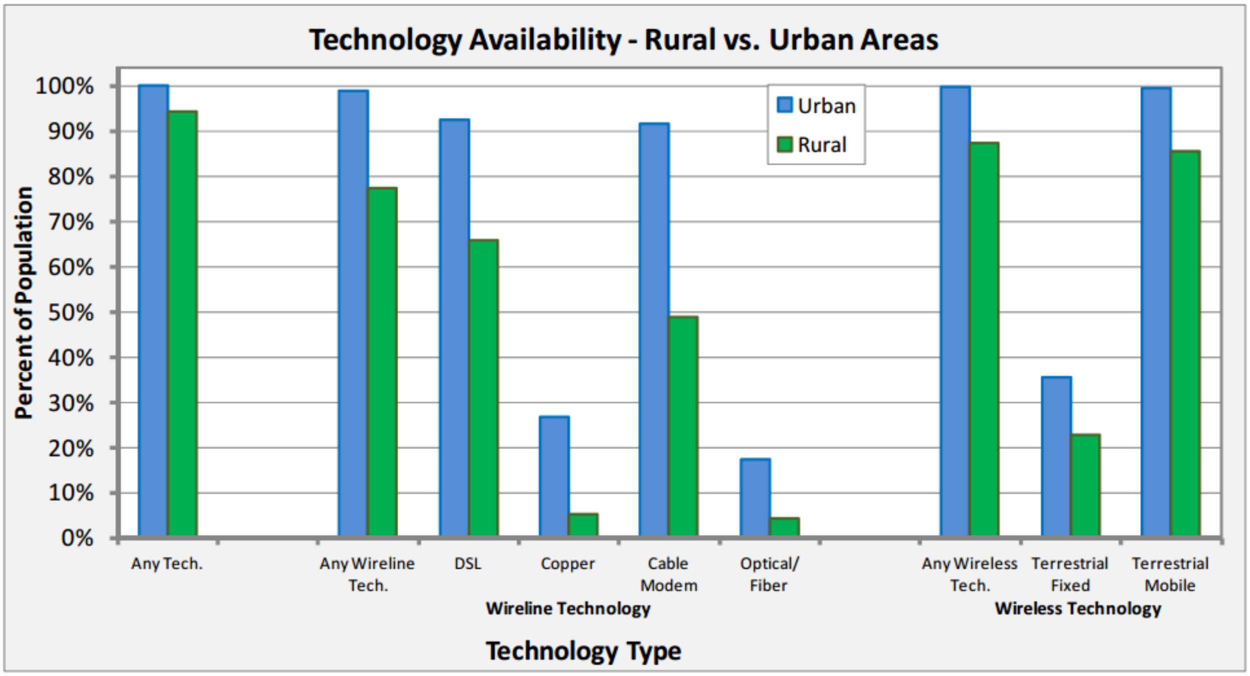
The research framework for this study was a transformative mixed-methods design. The intent of a transformative mixed-methods research framework is to examine a social issue for a marginalized population and to potentially bring about change that benefits the chosen population (Creswell, 2012). Within the context of this study, the marginalized population was high school students. The theoretical lens through which the researcher focused was Bourdieu's (1977) sociological theory, which suggests that schools are social fields comprised of competing social classes. Both students and teachers inhabit the same social field but have starkly different roles because of their social class (Burridge, 2014). Teachers are authoritarian figures while students are submissive recipients of information. Additionally, the theoretical framework considered critiques of student interest and how it does or does not translate to the classroom. The change sought within this study was to subvert the traditional educational social framework and make students active directors of their own learning by identifying their needs in relation to learning with technology.

Setting

The setting for this study was a small-to-medium size high school in rural southcentral Pennsylvania. The school was located in a primarily agricultural community where little economic development was occurring. There were 855 students in grades 9-12. Gender was split nearly even with 50.76% female students and 49.2% male students. There was little ethnic diversity. In fact, the overwhelming majority of students (97.08%) were white. The English Language Learner (ELL) population was less than half a percent. However, there was growing economic diversity as, at the time, 27.13% of students were classified as economically disadvantaged. Additionally, the special education population was growing, 18.25% (Pennsylvania Department of Education, 2015) at the time.

Due to the growing economic diversity of students and the rural geography, access to technology and high-speed internet was not as great as it might be in some urban areas. Figure 3.1 displays the availability of broadband internet access as reported by that National Broadband Map in 2011. With the exception of a small public library that served the entire school community, there were no public hotspots and some residents in the district were unable to receive high-speed internet service due to their remote locale. A technology survey administered by the district each year indicated that approximately 4% of students did not have Internet access available in their home and nearly 60% of students have to share their device with others at home. Additionally, the survey indicated that only 51% of students agree that using technology enhances learning or daily life, 50% believed they could easily perform basic computing skills, and only 14% were taught digital citizenship skills on a monthly basis (Brightbytes, 2016). This has created an increased awareness for the need to provide students with equitable access to devices and digital content. For this reason, three years ago, the district purchased a Chromebook for every student in grades 6-12. Students were permitted to keep these devices with them both in school and at home and will be given the devices upon graduation from high school. Because all students had access to the same device and the same tools for learning, this small high school was an optimal location to study rural high school students' perceptions of learning with technology.

Figure 3.1. **Technology Availability.** The chart displays the percent of population in rural vs. urban areas with reported access to various broadband technology types. Wireline technologies (DSL, Copper, Cable, Optical/Fiber) are shown in the center, while Wireless technologies (Terrestrial Fixed and Terrestrial Mobile) are displayed on the right (National Broadband Map, 2011).



The researcher previously worked in the district, has a good standing relationship with the administration, and will, therefore, had direct access to students. While this may have created potential limitations and bias, it allowed the researcher to have direct access to students within the district.

Participants/Sample

Participants in this study will included a heterogeneous group of students in ninth through twelfth grades. Selected students participated in a survey and/or focus group. Students who participated in the survey were identified through their enrollment in an English course for the first semester of the 2016-2017 school year. Students who participated in focus groups were organized into three heterogeneous focus groups of varying sizes. Students who participated in the survey may or may not have also participated in a focus group. An overlap may have been created if the students who were chosen to participate in a focus group were also enrolled in English during the first semester of the school year.

Participation for all subjects was voluntary. Selection of students was done in appropriate consultation with parents. Purposeful sampling to include school-wide, gender balanced, multiple grade-level, heterogeneous academic performance, and economically diverse students (Creswell, 2012) was required to adequately answer the research questions identified in this study and generalize the data to the entire school population. Students were chosen for the survey via their participation in English class. Focus groups were chosen by the building principal, who was asked to select students who would be willing to participate but that were also representative of varying academic levels, socio-economic groups, grade levels, and gender.

Over the past three years, students who participated in this study have been engaged in a 1:1 Chromebook program that provided access to an electronic device both during the school day and at home. Because of students' age and grade level, they have had the opportunity to experience learning in both a digital and non-digital context and were, therefore, able to articulate their perceptions of the program and help identify their outstanding needs in relation to learning with technology.

Stakeholders in this study included the school site-based focus teams (specifically the Technology Focus Team), administrators, district educators, and the broader community. Other local school districts who are also in the early stages of 1:1 programs may also consider themselves stakeholders in relation to similar commitments or challenges with 1:1 device programs.

Data

Because this was a mixed-methods study, both qualitative and quantitative data were collected.

Survey about Student Technology Use

Proposed quantitative data collection included the administration of a survey (Appendix A). The survey included questions about what types of technology students were currently using and the context for the use of these tools (home, school, both, or neither). The survey was administered by the researcher through the school e-mail system and students were given time in English class to answer the questions in the survey. Students used a web link, within the e-mail, to access a Google form with the survey questions. Every effort was made to ensure survey questions were constructed in age appropriate and understandable terms and were aligned with current, common, technology tools. Examples of technology tools (software programs or web sites) were provided to aid student understanding. The data collected with this survey allowed the researcher to develop a quick analysis of students' general technology use both in and out of the classroom.

Focus Groups

Qualitative data was collected during this study included transcripts from heterogeneous student focus groups. Philip and Garcia (2016) noted that, "Focus groups provide a context where participants can engage in interactive discussions and make comparisons among each other's experiences and opinions, allowing for 'concentrated amounts of data on precisely the topic of interest'" (p. 682). Focus groups were facilitated by the researcher. The focus groups were representative, both by age and across the spectrum of intellectual capacity. However the researcher observed that upper classmen were more comfortable speaking in front of their peers.

The focus group questions (Appendix B) were constructed in age appropriate and understandable terms and are aligned with current, common, technology tools. They were also informed by the literature review. When necessary, follow up information, definitions, or additional questions were provided to assist students in understanding and responding during the focus groups. The purpose of the focus group questions was to gather more in-depth information about students' device usage in school, how usage of this device impacted learning, and how the devices might be used more effectively in the classroom.

Data Collection

Data collection was done by the researcher. This provided consistency as one person was interacting with and recording information from the survey and focus groups. Additionally, focus groups were recorded and transcribed to ensure accuracy. Cost was a consideration in this decision. There is no funding available to hire a research assistant to participate in the collection of data. The data collection sequence was as follows.

First, the researcher surveyed students to develop a general understanding of their daily interaction with various types of technology and the context of its use (home, school, both, or neither). The survey tool was distributed to students online through the school e-mail system. Students were given time during their English class to complete the survey. Survey results were collected in Google Forms/Google Sheets. Google Forms provides a graphing and analysis tool that was used to review the results. By administering the survey in an English course, the researcher was able to request data from approximately 50% of the student population. This is because all students are required to take an English course each year but may not be enrolled in an English course at the time due to block scheduling.

Following administration of the survey, the researcher conducted focus groups with three heterogeneous groups of 3-10 students. The purpose of the focus group questions was to develop a more in-depth understanding of students' perceptions of the 1:1 program at their school, to define the tools or skills that they find beneficial to their learning, and to gain feedback or suggestions for teachers when integrating technology in the classroom. During each focus group, the researcher introduced herself and describes the purpose of the study. Then, she asked each group member to say his or her name and explained the focus group rules, including taking turns talking, allowing everyone to speak, and being forthcoming and honest in all responses. The researcher asked one question at a time until all questions are were answered, occasionally supplementing additional information or follow-up questions for clarification. During the focus groups, the researcher recorded the conversations for later transcription and coding. Students were aware that the conversation was being recorded but were provided with assurance that their names would not appear in the final report and that pseudonyms would be used during transcription.

Survey questions and focus group protocol were reviewed by outside sources for reliability. A timeline is included in Table 3.

TASK	DATE
English teachers distributed OPT OUT form to students	8/29/16
OPT OUT forms were due	9/9/16
Department Head sent names of opt outs to Researcher	By 9/15/16
Researcher e-mailed link to survey to participating students	9/15/16
Students took survey	9/16/16-9/21/16
Principal chose focus group students and handed out permission forms	By 9/12/16
Researcher collected permission forms and holds focus groups	9/28/16; 10/11/16

Table 3

Data Collection Timeline

Analysis

Survey data will be analyzed with the integrated charts built into Google Forms/Google Sheets. Descriptive statistical analysis will determine if there is any frequency to students' responses including what types of technology they are using and whether use occurs more frequently at home or at school. Specifically, descriptive statistics were used to indicate general tendencies in the data (is technology generally used more at home or school), the spread of scores (how much more), and a comparison of how one score relates to others (are certain technology tools used more often than others) (Creswell, 2012).

Information collected during the focus groups provided a more in-depth look at students' perceptions of the 1:1 technology program and allowed them to articulate their needs in relation to learning with these new devices and technology tools. Focus group data was analyzed through coding. The researcher examined transcripts from the focus groups to look for emergent categories and themes. Categories and themes were coded, calculated for frequency, and added to a matrix. From the emergent categories and themes, generalizations about the entire student population and their relation to the literature review were made.

Participant Rights

Participants were protected through strict adherence to the eight point criteria for IRB review as well as the six additional criteria for research involving children (UNE, 2012). First, risks to participants were identified as minimal. They included teachers having some discomfort over the results of student surveys and focus groups. Second, a risk benefit assessment was completed and the benefits outweigh the risks. While teachers may have felt uncomfortable about students' statements, the potential benefits of improving classroom instruction far exceed those risks. Third, subjects were selected equitably through stratified sampling. Surveys were given in English classes. All students are required to take English. Due to block scheduling, this allowed the researcher to interact with nearly 50% of the student population and with students of various academic strengths, socio-economic statuses, gender, and outside interests. Focus groups were chosen by the principal. However, various groups of students (academic, economically disadvantaged, special education) were chosen equitably so that no one subset of student was singled out or favored. Fourth, all participants and their parents were provided with documentation of informed consent, including an explanation of the purpose of the research and the research procedures. They were informed about the benefits and potential risks of participating. The informed consent document included information about confidentiality of records and how confidentiality was maintained. They were given contact information for questions about the research and given notice that their participation was voluntary. Students and their parents were able to opt out of the survey. Students participating in the focus groups were asked to sign an informed consent statement. Their parents were asked to sign this document as well. Consent documents are included in Appendix C. Each participant was given a copy of the informed consent document (criteria five). Sixth, the focus group protocol made provisions for data monitoring to ensure the privacy and confidentiality of participants. Seventh, all participants were given pseudonyms during data collection to protect their privacy. Data was stored on an encrypted drive to ensure confidentiality. Eighth, the researcher was careful not to pressure students into participating.   Finally, because the research participants were adolescents, informed consent was given by their parents. This was to protect young participants from feeling vulnerable or coerced to participate. In relation to adolescent participants, the informed consent forms were written at an 8th grade level to ensure that the reading level was appropriate for all participants and their parents.

Conclusion

There is a growing realization among public educators that 21st century skills are necessary for students to succeed in a constantly changing global economy. As such, many schools are implementing 1:1 programs or BYOT programs that require students to use technology as part of their everyday classroom instruction. However, little research has been done to determine what students need to use technology for academic purposes. Therefore, this transformational mixed-methods study sought to close that gap by surveying students to determine how their use of technology at home and school differ and to determine what can be done to better assist students in their academic use of technology. Methods used included a survey and focus groups. The survey collected basic information about students use of technology in context while the focus groups helped to provide in-depth information about students' perceptions of technology programs and how those programs can be improved to increase student learning.

CHAPTER FOUR

RESULTS/OUTCOMES

In this chapter, results are presented in correlation to the research questions used to drive this study. The overarching question that guided this research was: How can student voice be used to guide technology integration in rural high school classrooms? Specific research questions included:

1. How do rural high school students' use of technology in and outside of the classroom differ?
2. How are students currently using Chromebooks as a learning tool?
3. How do students articulate their academic learning needs in relation to 1:1 device usage in the classroom?

A mixed-methods transformational study was used to answer these questions. Both quantitative and qualitative data were collected. Quantitative data were collected in the form of a survey and qualitative data in the form of student focus groups.

Brief Review of Methodology

Data collection began on September 15, 2016 with the distribution of a survey to high school students who were enrolled in an English course. One hundred eighty-two students, of a possible 514, participated in the survey. Survey questions were designed to capture data regarding students' use of technology in context. Within the survey, students were asked about various types of technology, including communication technologies, web technologies, production technologies, and creation technologies. Students were given examples of tools in each category (see Appendix A) and asked to indicate whether they had ever used that technology and, if so, if they used it at school, home, both, or neither. This data was collected and stored in a spreadsheet and later displayed in charts for analysis. While the results were split relatively evenly among upper-classmen, the data indicated fewer responses from freshmen.

On September 28, 2016, the researcher conducted two focus groups of 3 – 10 students per group. A third focus group was conducted on October 11, 2016. During each focus group, the researcher asked a series of questions regarding how students use district-provided devices as a learning tool in an attempt to capture information about their academic learning needs in relation to technology integration in the classroom. All three focus groups were recorded electronically and transcribed. The transcripts were then reviewed and coded for emergent themes.

Research Questions and Results

Question #1

The first question that guided this research study was "How do rural high school students' use of technology in and outside of the classroom differ?" A "Student Technology Use" survey was created and distributed to students to provide information related to this question. Students were asked about a variety of tools in four categories (Communication Activities, Web Activities, Productivity Activities, and Creation Activities). Specifically, students were asked to identify tools that they use and where they use them (school, home, both, neither). The data from this survey is provided in various charts throughout this section. A text description of the results is included below each chart.

Communication Activities.

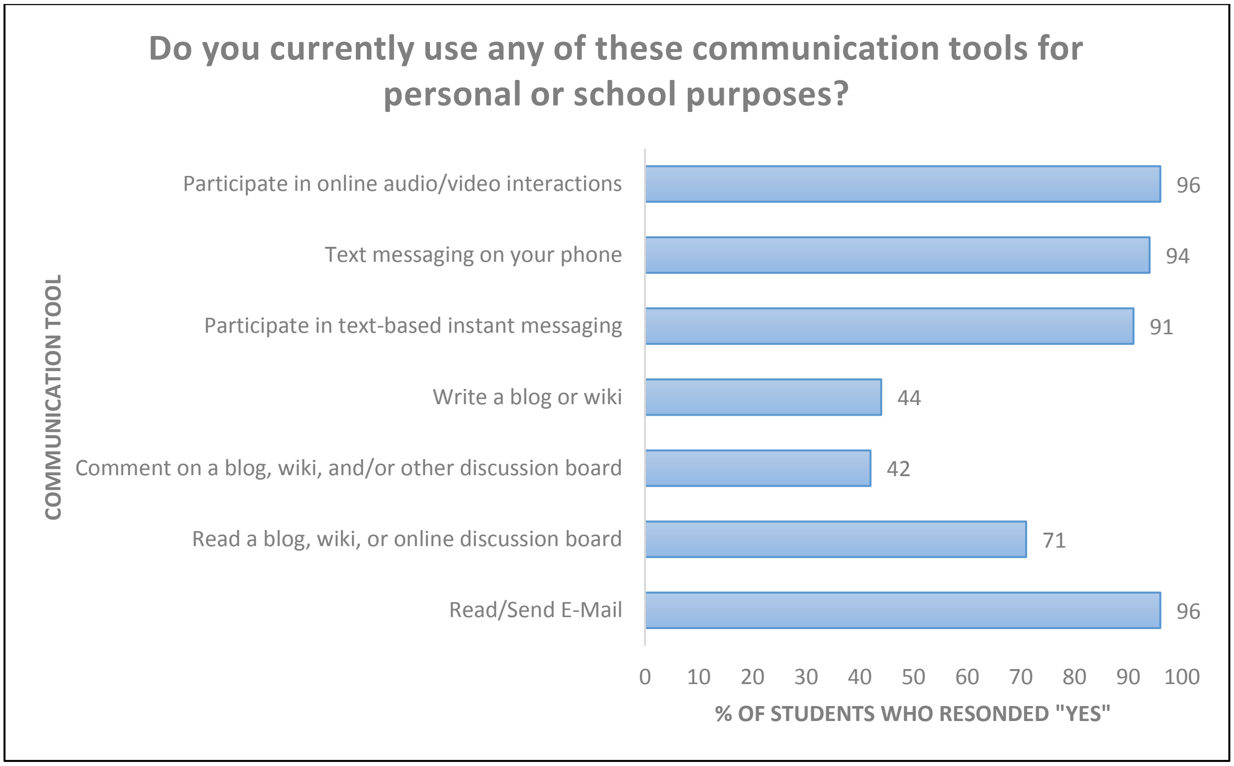


Figure 4.1. Horizontal bar chart displaying the percentage of students who responded "yes" (of the 182 who responded to the survey) when asked whether they have ever used various communication tools. The type of tool is located on the Y-axis and the percentage of students who responded "yes" are located on the X-axis. The data labels next to the bars represent the specific percentage for each tool.

The data displayed in Figure 4.1 demonstrates that the majority of students, defined for the purpose of this study as 70% or greater, have experience with many communication activities. They have read/sent e-mail, read blogs, wikis or online discussions, participated in instant-message conversations, used text messaging on their phones, and are experienced with online audio/video chat services. Few students had experience writing a blog or wiki or commenting on a blog or wiki, 44% and 42%, respectively. These results indicated that students often use tools that provide synchronous communication (audio/video tools, instant messaging, text messaging) rather than asynchronous communication (blogs, wikis, comments). The exception is e-mail. However, it is important to note that students are required to use e-mail as part of their participation in a 1:1 device program.

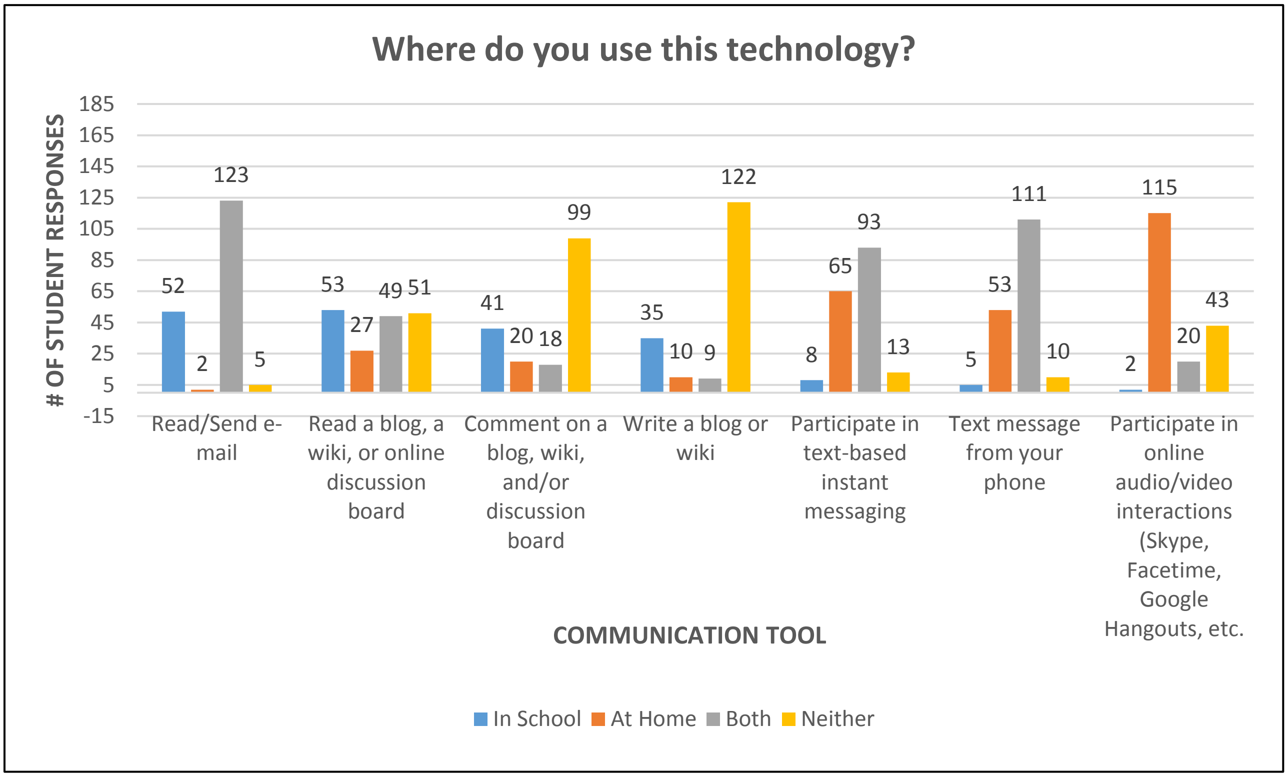


Figure 4.2. Vertical bar chart displaying the number of students who responded "in school, at home, both, or neither" to the question of where they use specific communication tools. The type of tool is located on the X-axis and the percentage of students who responded to each choice is located on the Y-axis. The data labels on top of the bars represent the specific percentage for each tool.

In addition to asking students if they had ever used specific communication tools, they were asked to indicate where they have used these tools. Their choices included in school, at home, both, or neither. The majority of students indicated that they read/sent e-mail, participated in instant messaging, and text messaged at both home and school. Results for reading a blog, wiki, or online discussion board were split relatively evenly between at school, at home, and both. Most audio/video interactions occurred at home and many students reported not writing or commenting on blogs and wikis. It is important to note that many audio/video chat sites had been blocked on the school filter at the time due to reported inappropriate activity.

Web Activities.

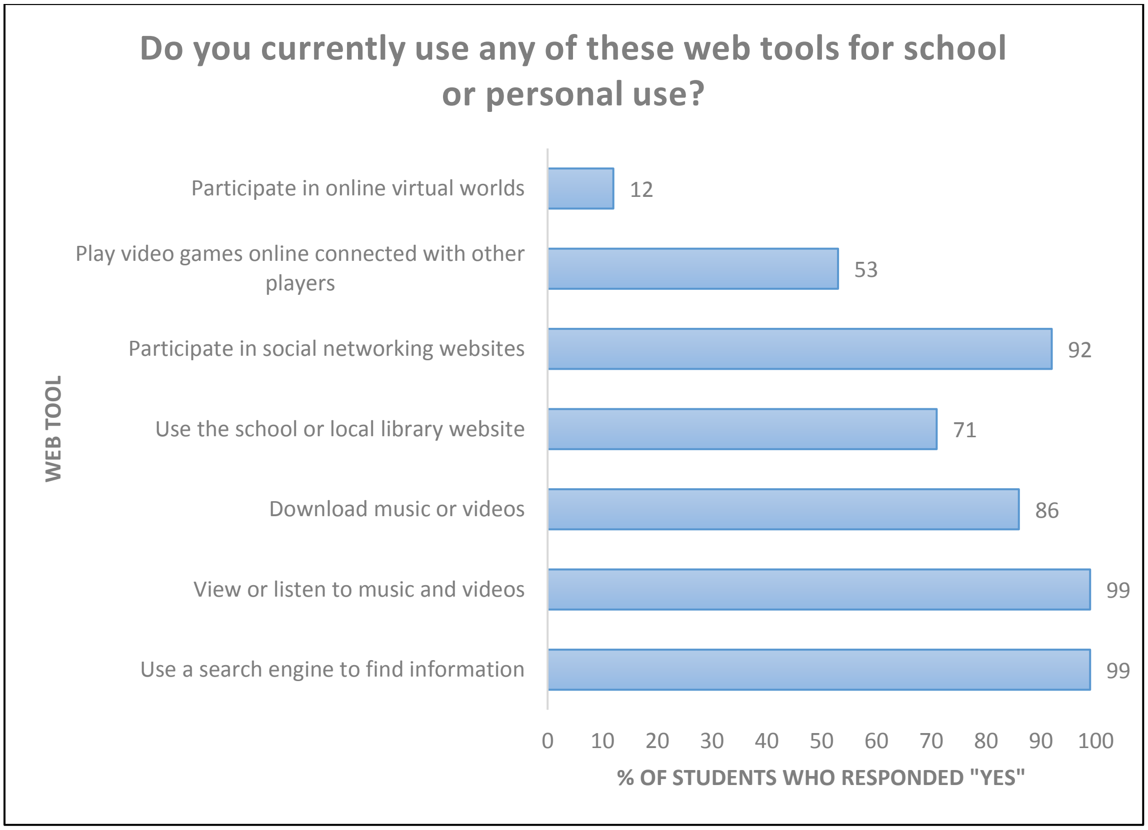


Figure 4.3. Horizontal bar chart displaying the percentage of students who responded “yes” (of the 182 who responded to the survey) when asked whether they have ever used various web-based tools. The type of tool is located on the Y-axis and the percentage of students who responded “yes” are located on the X-axis. The data labels next to the bars represent the specific percentage for each tool.

Based on survey data, students are relatively well-versed in relation to web-based activities. Nearly all survey respondents said they use search engines to find information and use the web to view videos or listen to music. Ninety-two percent of respondents said they use social media sites while 86% said they downloaded music and videos. Just over half of students play online video games. However, few students are familiar with online virtual worlds like Second Life or There.

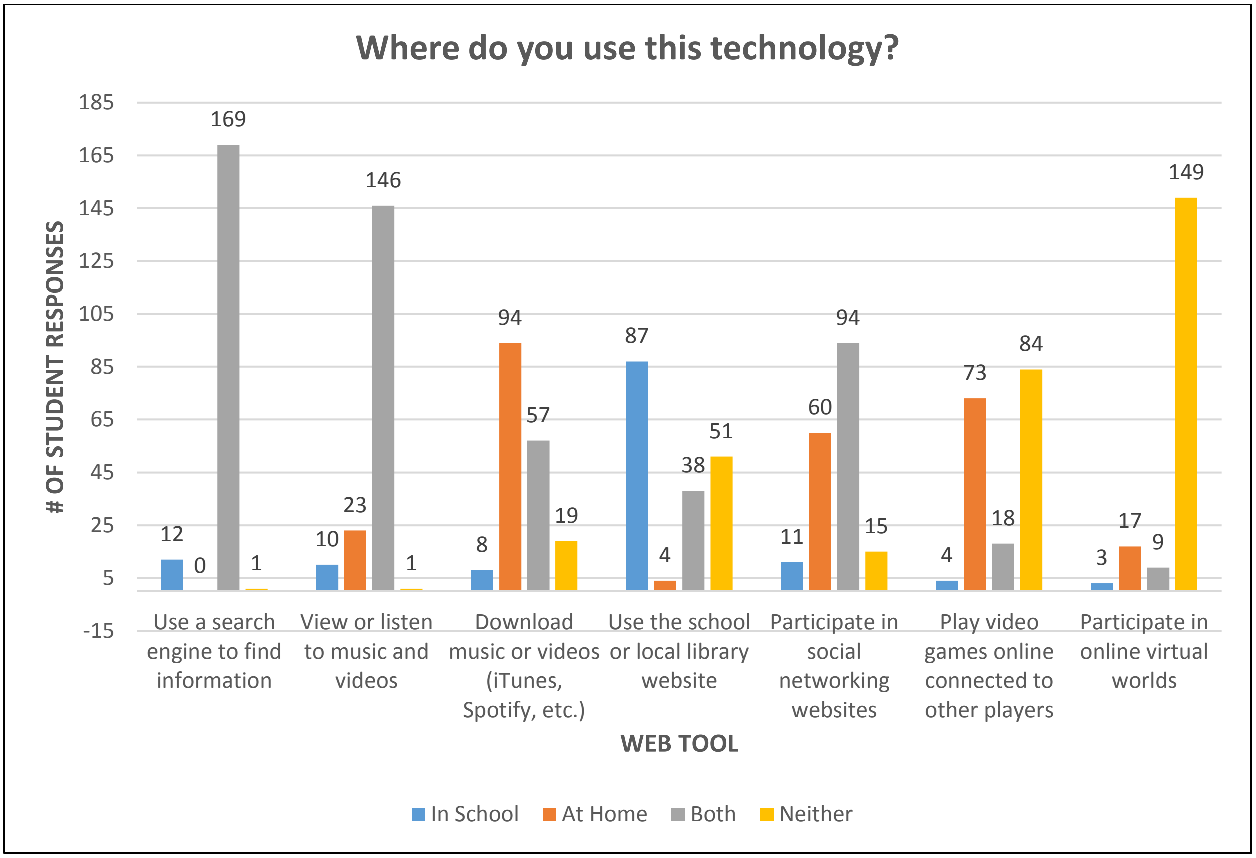


Figure 4.4. Vertical bar chart displaying the number of students who responded “in school, at home, both, or neither” to the question of where they use specific web tools. The type of tool is located on the X-axis and the number of students who responded to each choice is located on the Y-axis. The data labels on top of the bars represent the specific percentage for each tool.

In relation to where students used the previously described web-based tools, most students said they used internet search engines, video and audio services like You Tube and Spotify, and participated in social networks at both at home and at school. Students downloaded music primarily at home but used school and library websites mostly at school. The majority of students noted that they did not play video games and if they did it was primarily at home. Few students participated in online virtual worlds but those who did reported that they accessed these worlds at home.

Productivity Activities.

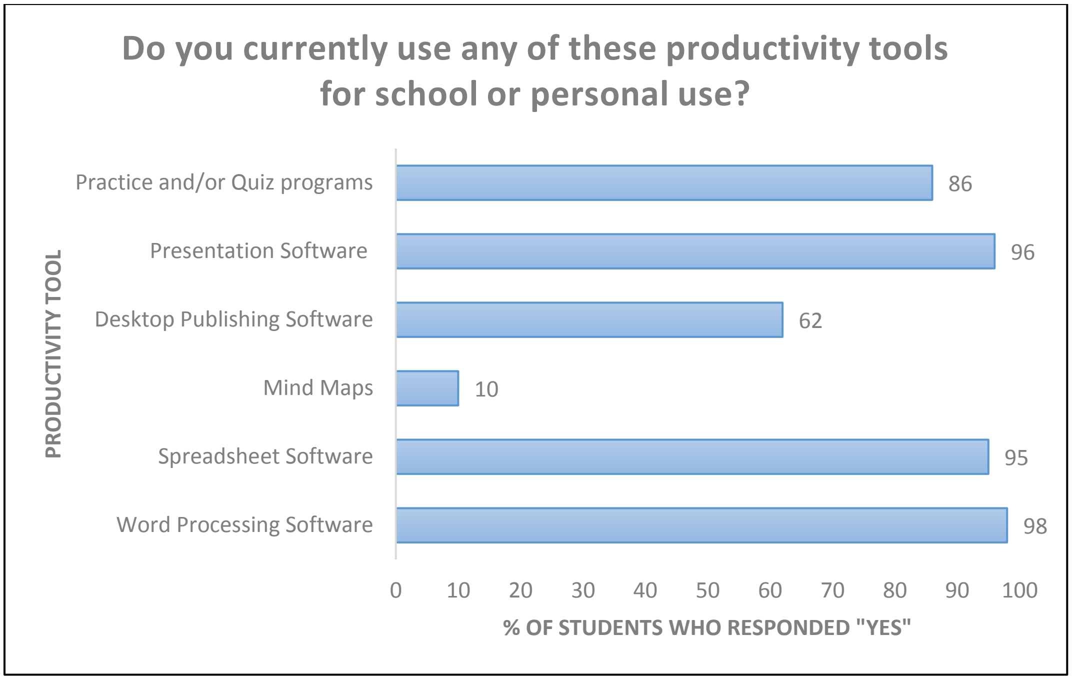


Figure 4.5. Horizontal bar chart displaying the percentage of students who responded “yes” (of the 182 who responded to the survey) when asked whether they have ever used various productivity tools. The type of tool is located on the Y-axis and the percentage of students who responded “yes” are located on the X-axis. The data labels next to the bars represent the specific percentage for each tool.

Figure 4.5 demonstrated that with the exception of desktop publishing software like Microsoft Publisher or Google Draw and mind mapping software like Mindmeister, the majority of students are familiar with a suite of technology-based productivity tools. Based on survey results, students had the most familiarity with word processing, spreadsheet, and presentation software.

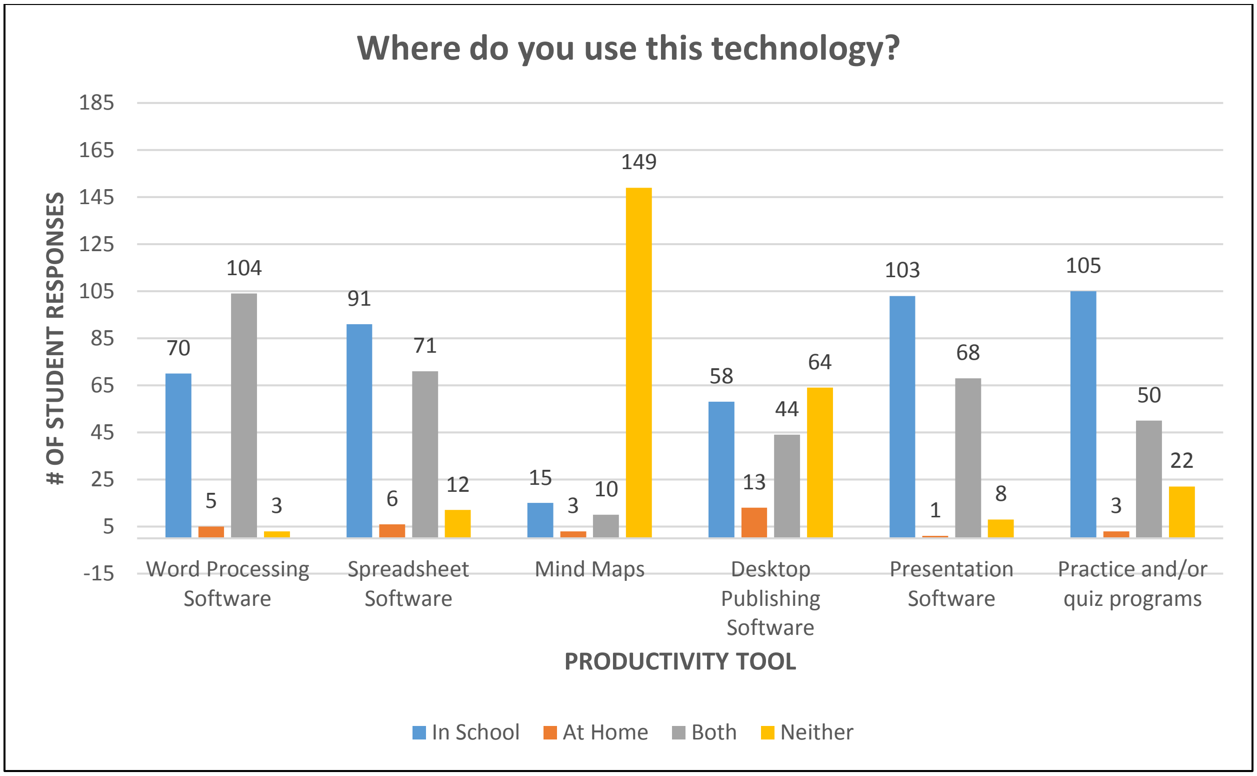


Figure 4.6. Vertical bar chart displaying the number of students who responded "in school, at home, both, or neither" to the question of where they use specific productivity tools. The type of tool is located on the X-axis and the number of students who responded to each choice is located on the Y-axis. The data labels on top of the bars represent the specific percentage for each tool.

Survey results indicated that students use productivity tools such as word processing programs and presentation software primarily at school or both home and school. Very few of the students surveyed indicated that they only used such tools at home. Because so few students report using productivity tools at home, the data suggested that students associate these tools with academic work. Of all the technology categories, productivity tools exceeded all others in school and home use and greatly trailed other tools in home use.

Creation Activities.

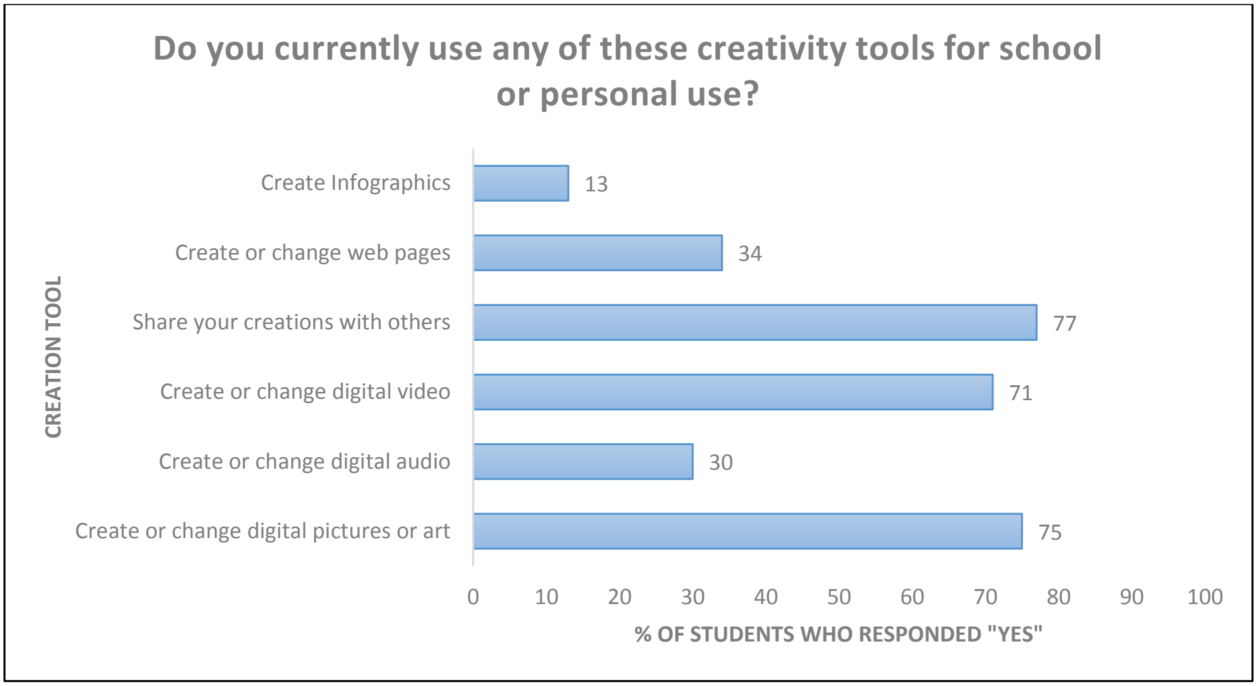


Figure 4.7. Horizontal bar chart displaying the percentage of students who responded "yes" (of the 182 who responded to the survey) when asked whether they have ever used various creation tools. The type of tool is located on the Y-axis and the percentage of students who responded "yes" are located on the X-axis. The data labels next to the bars represent the specific percentage for each tool.

The final category in the student technology survey was "creation tools." Survey data indicated that with the exception of creating digital audio, creating webpages, or crafting infographics, the majority of students reported using creativity tools either for school or personal use. More than 70% of survey respondents indicated that they had created videos, digital photos, and were able to share those creations with others. One explanation for these results is the correlation to courses offered in the course catalogue at the high school. Students have the option of taking Digital Photography I & II and Mass Media I & II. These courses focus on photo and video, respectively. There is a course focused on digital audio, titled "Music Technology Lab." However, it is offered by the music department and may be associated by many students as a "music" course requiring specialized knowledge such as reading music rather than a course on digital audio. Infographics are a relatively new media that is not found often in the current literature on educational technology research and, as such, have likely not caught on in K-12 classrooms yet.

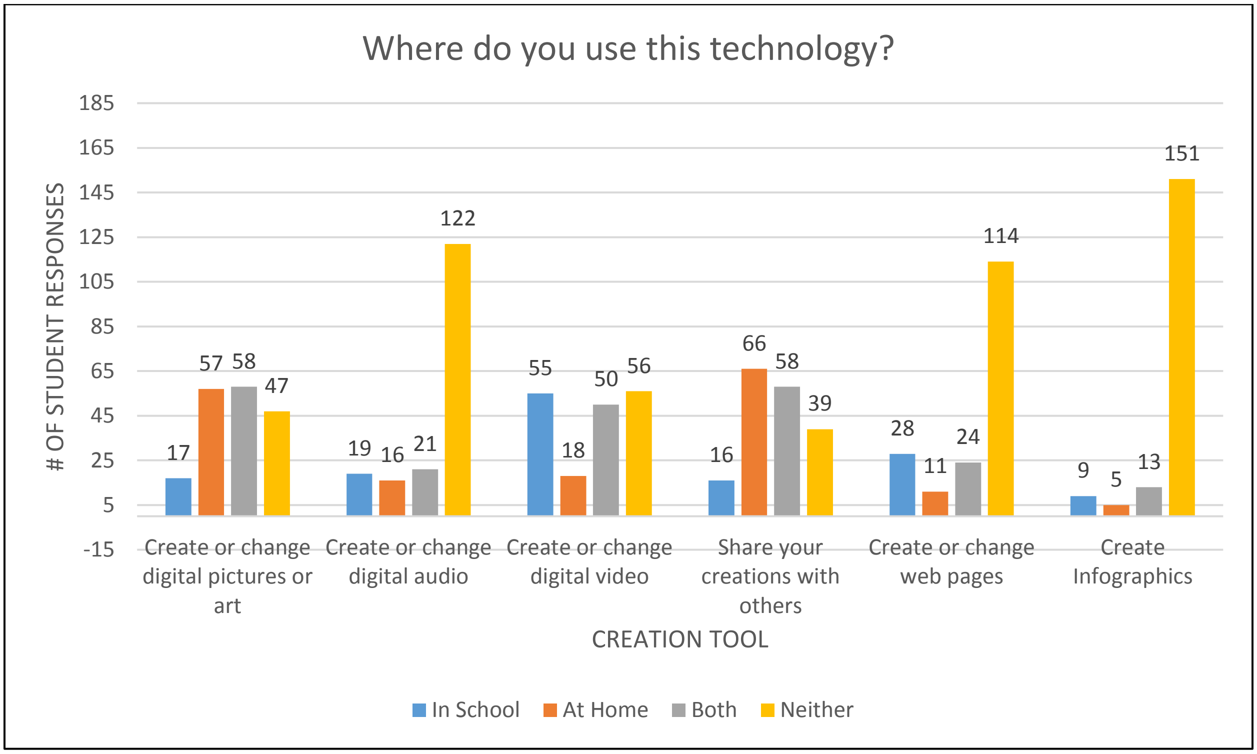


Figure 4.8. Vertical bar chart displaying the number of students who responded "in school, at home, both, or neither" to the question of where they use specific creation tools. The type of tool is located on the X-axis and the number of students who responded to each choice is located on the Y-axis. The data labels on top of the bars represent the specific percentage for each tool.

The data related to where students use creation tools was scattered. In some instances, students reported using a tool more at home or both school and home, such as digital photography and sharing creations with others. However, some tools such as those used to create digital audio, video, or webpages were reported as being used more at school or both school and home. This data correlates with the data reported in Figure 4.7 regarding which tools students are more familiar with. Those tools they reported using most are also those they use at home and school.

The original survey on which this one was based was found in the work of Hughes et al. (2015). The goal of their research was to "elucidate the personal, home, and school factors that contribute to children's Web 2.0 use outside of school." Within their study, Hughes et al. (2015) found that all students used the Internet to search for information, but far fewer had opportunities at school to design, create, write, and share Internet-based technologies. Rather, these types of activities occurred more frequently at home. The survey results from this study indicate similar results. Students use technology at school largely to research and write papers and submit them electronically. Other Internet technologies such as video chatting, creation of digital audio or video, participation in virtual worlds and other tools occurred primarily at home.

Question #2

Student Use. The second question that guided this research study was, "How are students currently using Chromebooks as a learning tool?" Data regarding this question was collected through the three focus group interviews with students.

Frequency. All students in the focus groups agreed that the use of their devices in class varied depending on the teacher. When asked to describe how and where they typically use technology at school, Student 1 (Focus Group 2) commented, "Some classes, not at all. And like some, it varies, like some I might use every day of the week and some you don't really use it or you might use it like once or twice a month." Student 1 (Focus Group 2) also noted only using her device to watch videos. This suggests there is little consistency in how teachers use the student devices for instruction.

Benefits. In general, students described appreciation for having the devices and the accompanying ability to access information at any time. Student 3 (Focus Group 1) noted, "I feel like we can go further into like understanding because we can look more up about it."

Student 2 (Focus Group 1) echoed those thoughts, “Yeah. We can know what the teacher says and you can expand on it and do some research and figure out some of our own information on the internet…” Student 1 (Focus Group 1) noted that he found the online technology to be superior to reading a book, saying, “…if we’re just reading out of the book, I don’t think it’s effective as if we’re watching a presentation or watching a documentary about it or something.” Several students noted the benefits of being able to access and submit assignments online as well as being able to share work with others through Google Drive.

Disadvantages. Many students described using their school-issued devices as a new way of completing traditional assignments. They talked at length about using the devices as a research tool, akin to a traditional encyclopedia. Student 1 (Focus Group 2) commented, “Sometimes teachers will be like, if you ask them a question, or … you want to know the definition of a word, they’ll be like, ‘Well, you have a Chromebook sitting in front of you.” Students also mentioned using their devices to do traditional tasks like taking quizzes and tests online and using online flashcard websites. Students expressed interest in their teachers using the devices as a tool, not as a replacement for instruction. Student 1 (Focus Group 2) lamented, “I think it would just be better if every teacher is like more on the same page with it...some people [teachers] overuse it and make it like, as if our Chromebook is our teacher, and other teachers are like okay, like maybe we’ll use it today, maybe we won’t.” An explanation for the variation among teachers’ use of the devices might be found in the barriers to technology integration introduced in Chapter 2. According to Desantis (2012), successful adoption of technology resources requires a combination of teachers who possess technology skills, personal self efficacy, and a school environment that fully encourages use of technology. Depending on their comfort with technology and professional development experiences, some teachers may not possess this combination.

One particular area of frustration students noted was their dissatisfaction with devices being used as a replacement for math instruction. Students defined instruction as their teachers providing them with information in a traditional whole-group lecture format. They felt that, in some instances, whole-group instruction was more effective than the activities they were completing on their devices. They discussed an interactive math tool that required the students to solve problems online. They indicated that they had to solve at least 10 in a row correctly to move forward in the program, but were not given any instruction if they did not get the required 10 questions correct. As Student 1 (Focus Group 3) put it, “You can answer like 600 questions, you know? And, you don’t really know why you’re getting them wrong.” There seems to be a lack of balance between no use and meaningful use of the devices. Ertmer and Ottenbreit-Leftwich (2010) note that successful technology integration is dependent on being able to conceptualize how technological, pedagogical, and content knowledge intersect. That is, a teacher must not only know the content they are teaching and how to teach, but also how technology will enhance or support this instruction. Students’ descriptions do not indicate that this knowledge is well developed among their teachers, yet.

Question #3

Learning Needs. The third question that guided this research study was, “How do students express their learning needs in relation to 1:1 device usage in the classroom?” Data regarding this question was again collected through the three focus group interviews with students.

Media Literacy. According to Jolls (2015), "Media literacy skills are 'constants' used in deconstructing and constructing communication through which to contextualize, acquire and apply content knowledge" (p. 68). Additionally, she noted, "Having media literacy skills, especially being able to use a consistent process of inquiry that is internalized, enhances the ability to communicate and to share ideas through a common vocabulary that transcends subject areas as well as geographic boundaries (Jolls, 2015, p. 68). When asked about media literacy during the focus groups conducted for this study, none of the students described it as anything close to the definition Jolls (2015) provided. While it would not be expected that high school students would articulate their definition in such detail, many did not know what the term "media literacy" meant and simply guessed at an answer. In fact, they described media literacy as understanding how to use technology-related media and knowing when to use it. Student 2 (Focus Group 2) responded, "It [media literacy] is a combination of like physically actually doing it and understanding it." When the researcher asked if the students felt like their teachers helped them learn media literacy, the responses were mixed. Student 2 (Focus Group 2) remarked, "I mean, some, if you have questions or really don't understand how they do it, like they know how to do it with program help. But, I think a lot of my teachers don't even know how to do it." Other students remarked that teachers just expected them to know how to do use the technology given to them. An interesting conversation that took place with focus group #1 included the following:

> Interviewer: Do you think your teachers help you develop media literacy?
>
> Student 1: Not to be mean but some of the younger teachers sort of … they help us a lot more but the older teachers, it takes them a little bit kind of to become media literate.
>
> Student 2: Plus, they're trying to figure it out themselves.

Student 3: Yeah, so we don't really use it in class because they're afraid of using it so you kind of have to teach them.

It was clear that not only did students not understand media literacy as it is described in the literature, neither do their teachers.

Software Incompatibility. During the 2016-2017 school year, the district made the decision to start replacing some of the existing Chromebooks with standard Windows laptops. Students noted that while the durability of the Chromebooks was an issue, the new computers were causing problems with software incompatibility. Because the Chromebook is a web-based device designed to use only cloud applications, students who currently have this device have no choice but to use the Google Apps for Education Suite. However, students who have the new laptops now have Microsoft Office, in addition to the ability to use Google Apps for Education. Students cited trouble accessing assignments posted online because they may not all be in the same format, making it difficult for students without Microsoft Word to download and convert into a different format. For example, Student 5 (Focus Group 1) stated, "Sometimes, if [teachers] send us something our computer doesn't support, we have to redo in a different format." Student 3 (Focus Group 3) mentioned that "teachers only use Word and we mostly use Google Docs. So, they don't really work well together." It did not appear from the discussions that any pre-planning for this transition had occurred.

Student Training. Interestingly, students expressed dissatisfaction with the lack of training they received in preparation for using the devices. Student 1 (Focus Group 2) related that it would have been helpful if when he first received his device, he also received some training on the device. When asked how teachers could improve learning with technology, one student commented, "Maybe if it's…like a new device or a new program, maybe like a small, like explanation or like class, like a teaching, like teach how to do it sometime, whether it's in detail or if it's just like the basics." Students also noted that they had been taught Microsoft Office in Middle School, but were given a device in High School that only supported Google Docs and this was frustrating. Students did not seem to want to learn how to use applications on their own, especially when there were deadlines involved. Rather, Student 1 (Focus Group 2) described the Chromebooks as "They just kind of threw it all at you."

In a study of 1:1 programs, Grundmeyer (2013) describes the students in his study as having little understanding of why they were participating in a 1:1 program or what the program's goals were. Students' desire for more training to better understand how to use the devices for academic gain may hint at a similar lack of knowledge and understanding. Students may feel that they were simply handed a device and expected to figure out how to use it on their own.

Confusion over Sharing. One interesting theme that emerged during the researcher's conversations with students was confusion over sharing. Students expressed that they very much appreciated and found useful the ability to share presentations, papers, and other types of documents for group projects. They also appreciated that Google tracked who contributed to the file so that teachers could see who had done the majority of the work. Student 1 (Group 1) described the ability to scan class discussions and see "where your answer fits in" as being helpful. However, when they started using the sharing feature to share notes and other assignments with each other, they felt scolded. Student #4 (Focus Group 3) told the group, "Some to most teachers don't really like that feature [sharing] because they want your work to be individual, but why not use the tool if you have it?" Student 5 (Group 3) explained that this feature helped him stay on track. "If you missed notes or something, they are online," he noted.

Student 6 (Group 3) pointed out the frustration of group projects and feeling like he “only earned an eighth of the material.” There seemed to be a clear indication that students were confused over when they were allowed to collaborate and when they were not. Again, this may hint that the expectations for use are unclear to students as described in Grundmeyer’s (2013) work.

Student Voice. One area of particular concern is the lack of voice students feel they have in terms of how they use technology. They noted that teachers often asked a question or two about technology on end-of-course surveys, but students rarely saw change as a result. They even mentioned the general technology survey (BrightBytes) that they take at the end of the year but did not feel that the results from this survey were used to change instruction, either. Some teachers, they noted asked at the end of a lesson if they liked a particular tool, but not all teachers did that. In fact, in some cases, it was the opposite. Student #2 (Focus Group 3) noted, “I feel like they ask you but they don’t really care. Every time we say we don’t want to do it [an assignment with a particular tool], they don’t take it into consideration and we have to do in anyway.” Student 5 (Group 3) explained that teachers often want students to use a specific tool but, “we could show them more.” One story that was particularly disturbing was Student 1 (Focus Group 2) who relayed that she and her classmates are required to create book advertisements each quarter. She noted, “One girl wanted to like do a Google Slideshow Presentation showing the title of the book and pictures and stuff. And, [the teacher] was like, ‘No, you’re just going to copy what I’m saying and go sit back down.’” The focus group findings indicate that there is discord among students regarding whether or not their feedback is used for improvement. That students want are interested in suggesting learning activities suggests that they are willing to participate in some co-construction of their learning experiences.

This is supported by Philip and Garcia (2015) who noted that students often have little interest in mediated interactions with technology.

Other Findings

Infrastructure. One overwhelming theme that appeared throughout the focus groups was the need for reliable infrastructure. Essentially, student responses comprised into a single statement, “The technology does not do us any good if it is not reliable” (this statement was suggested to the students in Focus Group 3 and they unanimously agreed). Students spoke at length about the troublesome Wi-Fi. They talked about their Wi-Fi crashing when an entire class tried to bring their Chromebooks up in class all at the same time. They noted that they are unable to bring their own devices even though they are allowed because they cannot get those devices to connect to the network, either. Student 1 (Focus Group 2) relayed a story about an activity in math class in which the WiFi crashed and the teacher did not know how to continue because he relied on a particular website so heavily. Clearly, an outdated or inadequate infrastructure was a barrier to students’ and teachers’ use of technology in the classroom.

Durability of Devices. Students also spoke about the durability of the devices. Student 3 (Focus Group 3) noted that his screen had broken, he had turned it in for service, and the new screen was broken when he got the device back. Students also noted that unless their device was not functioning, they would not turn it in for service because they knew it would cost them their $25 protection plan and they would have to buy another plan. This student even pulled his Chromebook out of his bookbag to show me that the hinges were broken on both sides. Student 4 (Focus Group 3) noted that his Chromebook was three years old and was really slowing down. He had considered bringing his own computer to school but assumed he would have issues with the Wi-Fi. Students also noted durability of teacher devices as being an issue. Student 1 (Focus

Group 1) made the point that, "Our computers are brand new and theirs are a few years old. They may not have the same compatibilities." Student 1 (Focus Group 2) relayed a story of a teacher's SmartBoard not working and explained that the teacher "freaked out" because they had to write things on the white board. This suggests a recognition on the part of students that teachers do use some technology tools, like SMARTBoards, regularly.

Device Incompatibility. Both 9th grade and 11th grade students and teachers received new devices this year. Instead of their previously issued Chromebook, these students received a Windows laptop, creating a compatibility issue. As mentioned previously, the devices have different software applications on them. One particular area to note is that students expressed the need for their teachers to have the same devices as the students so that they could plan activities that were compatible for all. Student 1 (Focus Group 2) noted that "It's a disadvantage that not every person in the school has the same one [device]. Student 9 (Focus Group 3) relayed his frustration with the difference in teacher and student devices, saying "You have to transfer a document to Word and then again to Google Docs and it's just a big mess." Students' comments indicated frustration in the lack of continuity in document formatting between themselves and teachers.

Filter Frustration. One final focus group finding to note is filtering and the perception students have that it keeps them from being able to do their work. While the researcher did not directly ask any questions about filtering, students did identify content filters as a barrier to their learning. Students expressed frustration that many websites are blocked and it is difficult for them to complete research projects, especially those on controversial topics. They noted difficulties completing projects in Humane Sexuality class on topics such as breast cancer and rape and even topics in history class on religion. Student 4 (Focus Group 3) noted, "We have the filters inhibiting our research and our ability to learn on our own." While filtering is meant to keep students safe and is required to receive eRate funding from the Federal Communications Commission, it can also prohibit students from independent learning.

All three of these findings suggest that students experience similar barriers as teachers in relation to their use of technology for learning. As Kopcha (2012) points out, even if teachers have access, they may feel like they do not if the technology does not function as it should. Students' comments suggest that they feel the same way. If the technology is there, but it does not work reliably, then it is not of significance to use it.

CHAPTER FIVE

DISCUSSION/SUMMARY

Through a detailed discussion of study findings and relevant literature, this chapter presents insights gained about the students' perceptions of technology use and the implementation of a 1:1 program. Information about students' technology use and perceptions were explored through the distribution of a survey and through heterogeneous focus groups. Survey results were graphed and analyzed for trends. Focus group transcripts were coded analyzed for emergent themes. Chapter 5 begins with a discussion of the themes and relevant literature. Following this discussion, implications of the study findings are presented. Finally, the chapter concludes with recommendations to guide future actions and research inquiry on student voice and K-12 technology integration.

Review of Research Questions

The overarching question that guided this research was: How can student voice be used to guide technology integration in rural high school classrooms? Specific research questions included:

1. How do rural high school students' use of technology in and outside of the classroom differ?
2. How are students currently using Chromebooks as a learning tool?
3. How do students articulate their academic learning needs in relation to 1:1 device usage in the classroom?

Summary of Responses, Interpretation, and Alignment with Literature

A summary of the results for each research question as well as an interpretation of the results is included in the sections that follow. A connection to the literature on instructional technology is also provided.

Question #1

The first question that guided this research study was, “How do rural high school students’ use of technology in and outside of the classroom differ?” Study results indicate that, in the classroom, students conduct Internet research, prepare presentations, use online quiz sites, and submit assignments electronically. At home, they engage with technology in a more social manner by texting, using social media sites, and accessing online video games. In many ways, students’ school experiences with technology have been replications of former paper assignments. Instead of conducting research in the library and searching for information in textbooks, students now use their devices to search the Internet for that information. Rather than completing worksheets with pencil and paper, students type their answers and submit the worksheet electronically. Rather than take quizzes on paper, they use quiz sites online. This suggests that classroom technology experiences that students have had have been largely a substitution for traditional classroom activities. This can be demonstrated by Puentedura’s (2006) Substitution, Augmentation, Modification, and Redefinition (SAMR) model (see Figure 5.1).

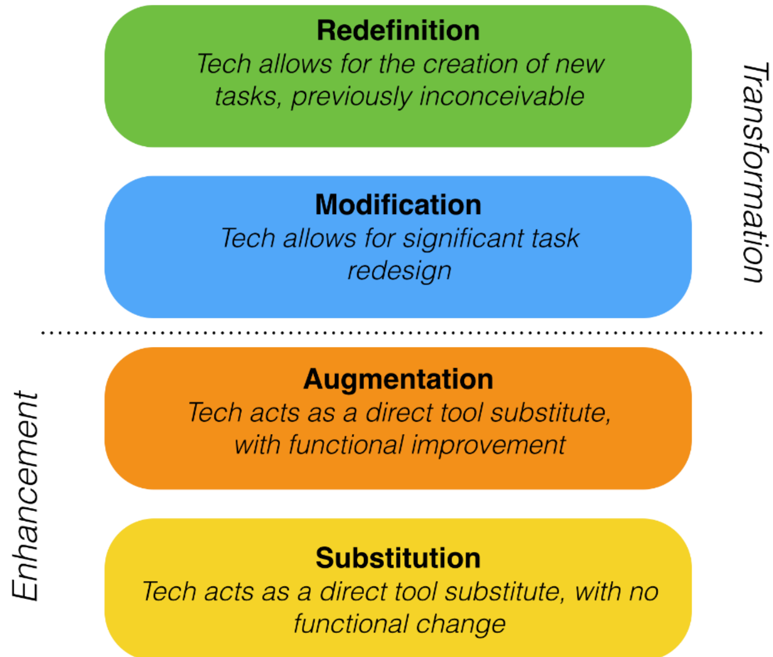


Figure 5.1. Puentendura's (2006) Substitution, Augmentation, Modification, and Redefinition (SAMR) model (retrieved from http://www.hippasus.com/rrpweblog.

Puentedura's (2006) SAMR model can be used to help teachers categorize their use of technology in the classroom. The model starts with technology use as substitute, with no functional change to redefinition, where technology is used to complete tasks that were previously inconceivable. Teachers are encouraged to move up the ladder, from using technology to enhance learning to using technology to transform learning by providing higher level technology activities for students to complete.

Question #2

The second question that guided this research study was, "How are students currently using Chromebooks as a learning tool?" Study results indicate that there is little consistency regarding the frequency of use and that at least some students see the devices as being used as a replacement for traditional? instruction. This does not translate into increased interest and proficiency. As Lee et al. (2014) note, even when students are largely proficient in using computers as productivity tools for activities such as presentations, Internet research, and word processing, access to devices does not translate directly to proficient and adventurous use of technology for learning. Additionally, students are keen to recognize when technology is used as a replacement for instruction. They know that simply because they are required to complete an assignment does not mean they will learn more. In fact, it may very well be the opposite. Grundmeyer (2014) points out that technology can actually be a distraction if not used as an effective learning tool. Minimizing distractions, he says, requires teachers that have the skills and training to fully leverage technology for learning.

Question #3

The third question that guided this study was, "How do students express their learning needs in relation to 1:1 device usage in the classroom?" Study results indicate that students encounter many of the same barriers as teachers. They reported wanting more training on their devices, encountering issues with compatibility, and experiencing difficulty with an outdated or inadequate infrastructure. This finding is supported by Weston and Bain (2010) who explain that a body of evidence demonstrates that sustainable change, innovation, and reform, technological or otherwise, is often not realized in education. This may be because large-scale technological change requires a multitude of smaller changes to occur concurrently. Equipping students with devices is not enough, students must be taught how to use them, teachers must understand how to use them for teaching and learning, and infrastructure must be maintained to support the large-scale use of devices.

Implications and Recommendations for Action

The study of students' thoughts and perceptions regarding technology use in the provided guidance for several actions to be taken. First and foremost, this study validated students' voices and suggested that students are a valuable source of information. As noted by Mossiou and Hope (2015), students view academic and social issues in schools differently than adults do and, as a result, can offer insightful perspectives that can make teachers change their practices. The students consulted during this study offered their own insightful perspectives about what was beneficial about the 1:1 device program and what they would change. Their perspectives could be used to change instruction and academic use of the devices. Thus, the first recommendation is to engage students in conversations and solicit their recommendations about technology use in the classroom.

A second recommendation is to provide teachers with a model or framework they can use to evaluate their use of technology in the classroom. As mentioned previously, Puentendura's (2016) SAMR model may provide a simple framework to accomplish this task. While some criticize the SAMR model as lacking empirical analysis, lacking context, and having too rigid a structure (Hamilton, Rosenberg, & Akcaoglu, 2016), it provides a simple framework for analyzing technology usage and helps teachers differentiate when they are using technology as a replacement for traditional activities versus using technology to improve learning. Once teachers understand how to categorize their use of technology using a model like SAMR, they can move on to more complex models like the Technological Pedagogical Content Knowledge (PACK) framework, which frames the application technology in three types of knowledge: technology, content, and pedagogical (Hamilton, Rosenberg, & Akcaoglu, 2016).

A third recommendation is to address the barriers to meaningful technology integration. While these barriers are discussed at length in the literature as they apply to teachers, the results of this study suggest that students face similar challenges. One barrier that students discussed in detail was the compatibility issue caused by the introduction of new devices to half of the student body. Prior to the 16-17 school year, all students in the high school were using the same platform, a Chromebook. At the start of the 16-17 school year, 9^{th} and 11^{th} graders were given Windows laptop. This means that some students have access to Windows and Chrome applications while some students only have access to Chrome. While the purchase of devices is largely based on budget, it is recommended that the district use a more systematic approach to the implementation of a new platform. Until all students are working on the same device, it is recommended that training, for teachers and students, be focused on the platform that all students have access to (in this case, G Suite). Once all students have access to the same device, training can be done on a new platform. This eliminates confusion and ensures all students have access to similar resources.

Inherent in the previous recommendation is student training. Much of the literature focuses on professional development programming for teachers. There is little research on similar training for students. However, the results of this study indicate that students felt that some instruction on how to use their devices, even if minimal, would have been helpful to them. Thus, it is recommended that students also be provided with training on basic functionality on their device.

Students also discussed the need for a reliable infrastructure. This is cited in the literature as a common barrier to successful technology integration (Kopcha, 2012). If the wireless network does not support the number of devices that are connected to it and does not work reliably, students see it as a distraction and a detractor from using their devices in the classroom. A final recommendation, then, is to develop a detailed and strategic plan to ensure that the wireless network is capable of handling an increasing number of devices and increased network traffic. This includes replacement of access points, switches, routers, and other network components. Purchasing devices for a 1:1 environment is a significant expense, one that is wasted on an outdated/insufficient wireless network.

Recommendations for Further Study

This study has helped to legitimize the voice of students to improve technology integration in the classroom. The data collected suggested that students are capable of identifying the benefits and disadvantages of a 1:1 device program and technology integration in general. The next logical step is to implement student recommendations and collect data on the outcomes. This data would help to further support the use of student feedback in the development and implementation of technology integration programs.

Conclusion

This transformative mixed-methods study sought to give voice to high school students and highlight their perceptions of a 1:1 program in a rural high school. The feedback that emerged as a result of the study indicated that students experience many of the same barriers to learning with technology as teachers do when teaching with technology. While students appreciate the devices they have been provided, they articulated many ways that 1:1 programs could be improved. Like their teachers, they want to be supported in their use of the devices for learning. They do not wish to simply use technology for technology's sake. They want to interact with the devices in meaningful ways. In order to do so, they need proper instruction, varied experiences, and a reliable infrastructure.

REFERENCES

An., Y. & Reigeluth, C. (2011). Creating technology-enhanced, learner-centered classrooms. *Journal of Digital Learning in Teacher Education, 28*(2), 54-62.

Belland, B.R. (2008). Using the theory of habitus to move beyond the study of barriers to technology integration. *Computers & Education*, *52*(2), 353-364.

Beckman, K., Bennett, S., & Lockyer, L. (2014). Understanding students' use and value of technology for learning. *Learning, Media and Technology*, *39*(3), 346-367.

Bourdieu, P. (1977). Cultural Reproductiohn and and Social Reproduction. In Karabel, J. and Halsey, H. H., eds, *Power and Ideology in Education*. OUP, Oxford.

Bragg, S. (2007). 'But I listen to children anyway!' – teacher perspectives on pupil voice. *Educational Action Research*, *15*(4), 505-518.

Brightbytes Survey Data (Big Spring High School). (2014). *Clarity*. Retreived from www.brightbytes.org

Brinkerhoff, J. (2006). Effects of a long-duration, professional development academy on technology skills, computer self-efficacy, and technology integration beliefs and practices. *Journal of Research on Technology in Education*, *39*(1), 22–43.

Broadband Statistics Report. (2011). *National Broadband Map.* Retrieved from http://www.broadbandmap.gov/download/reports/national-broadband-map-broadband-availability-in-rural-vs-urban-areas.pdf

Bron, J. & Veugelers, W. (2014). Why we need to involve our students in curriculum design: Five arguments for student voice. *Curriculum and Teaching Dialogue, 16*(1 &2): 125-139.

Burridge, P. (2014). Understanding teachers' pedagogic choice: A sociological framework combining the work of Bourdieu and Giddens. *Educational Studies*, *40*(5), 571-589.

Coghlan, D. & Brannick, T. (2014). *Doing action research in your own organization.* Los Angeles, CA: Sage.

Creswell, J.W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Boston, MA: Pearson.

DeSantis, J. (2012). Getting the most from your interactive whiteboard investment: Three guiding principles for designing effective professional development. *The Clearing House*, *85*(2), 51-55.

Dolan, J. E. (2016). Splicing the divide: A review of research on the evolving digital divide among K-12 students. *Journal of Research on Technology in Education*, *48*(1): 16-37.

Edwards, M. (2013). *Every child, every day: A digital conversion model for student achievement.* Boston, MA: Pearson.

Ertmer, P.A., & Ottenbreit-Leftwich, A.T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research of Technology in Education*, *42*(3), 255-284.

Ferguson, D.L., Hanreddy, A., & Draxton, S. (2011). Giving students voice as a strategy for improving teacher practice. *London Review of Education*, 9(1), 55-70.

Fink, J. (2015, Fall). Crazy for Chromebooks. *Scholastic Administrator,* 36-38.

Fullan, M. G. (1991). *The new meaning of educational change.* London: Cassell.

Fullan, M. (2013). *Stratosphere: Integrating technology, pedagogy, and change knowledge.* Toronto, Ontario: Pearson.

Grant, M. M., Tamim, S., Brown, D.B., Sweeny, J.P., Ferguson, F.K. & Jones, L.B. (2015). Teaching and learning with mobile computing devices: Case study in K-12 classrooms. *TechTrends, 59*(4), 32-45.

Grundmeyer, T. (2014). Adopting technology: Using student qualitative data and Gartner's hype cycle. *Journal of Education and Training Studies*, *2*(1): 207-216.

Hamilton, E.R., Rosenberg, J.M., & Akeaoglu, M. (2016). The substitution augmentation modification redefinition (SAMR) model: A critical review and suggestions for its use. *TechTrends, 60:* 433-441.

Harper, B., & Milman, N. B. (2016). One-to-one technology in K-12 classrooms: A review of the literature from 2004 through 2014. *Journal of Research on Technology in Education, 48*(2): 129-142.

Hixon, E. & Buckenmeyer, J. (2009). Revisiting technology integration in schools: Implications for professional development. *Computers in the Schools*, *26*(2), 130-146.

Hughes, J.E., Read, M.F., Jones, S., & Mahometa, M. (2015). Predicting middle school students' use of web 2.0 technologies out of school using home and school technological variables. *Journal of Research on Technology in Education, 47*(4), 211-228.

Jonas, M.E. (2011). Dewey's conception of interest and its significance for teacher education. *Educational Philosophy and Theory, 43*(2), 112-129.

Julls, T. (2015). The new curricula: How media literacy education transforms teaching and learning. *Journal of Media Literacy Education, 7*(1), 65-71.

Kane, R. G., & Chimwaynge, C. (2014). Teacher action research and student voice: Making sense of learning in secondary school. *Action Research, 12*(1), 52-77.

Keddie, A. (2015). Student voice and teacher accountability: possibilities and problematics. *Pedagogy, Culture, & Society*, *23*(2), 225-244.

Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, *59*(4), 1109–1121.

Krueger, N. (2014, August 8). 4 perspectives on 1:1 success. *International Society for Technology in Education*. Retrieved from https://www.iste.org/explore/articleDetail?articleid=119

Lee, K., Tsai, P.S., Chai, C.S., Koh, J.H.L. (2014). Students' perceptions of self-directed learning and collaborative learning with and without technology. *Journal of Computer Assisted Learning*, *30*, 425-437.

Liu, S., Tsai, H., Huang, Y. (2015). Collaborative professional development of mentor teachers and pre-service teachers in relation to technology integration. *Educational Technology & Society, 18*(3), 161-172.

McClean, K. J. (2016). The implementation of Bring Your Own Device (BYOD) in primary [elementary] schools. *Frontiers in Psychology*, *7*, 1-3.

Messiou, K., & Hope, M.A. (2016). The danger of subverting students' views in schools. *International Journal of Inclusive Education*, *19*(10), 1009-1021.

Mitra, D., Serriere, S., Kirshner, B. (2014). Youth participation in U.S. contexts: Student voice without a national mandate. *Children & Society*, *28*, 292-304.

Morsink, P.M., Hagerman, M.S., Heintz, A., Boyer, D. M., Harris, R., Kereluik, K., Hartman, D.K. (2011). Professional development to support TPACK technology integration: The initial learning trajectories of thirteen fifth- and sixth-grade educators. *Journal of Education*, *191*(2), 3-16.

Mutch, C.A. (2006). Adapting Bourdieu's field theory to explain decision-making process in educational policy. In V. A. Anfara, Jr. & N. T. Mertz (Eds.), *Theoretical Frameworks in Qualitative Research* (109-128). Thousand Oaks, CA: Sage Publications.

Nelson, P.M., Ysseldyke, J.E., & Christ, T.J. (2015). Student perceptions of the classroom environment: Actionable feedback to guide core instruction. *Assessment for Effective Intervention*, *4*(1), 16-27.

Pan, S.C., & Franklin, T. (2011). In-Service teachers' self efficacy, professional development, and web 2.0 tools for integration. *New Horizons in Education*, *59*(3), 28 – 40.

Pennsylvania Department of Education. (2015). *Big Spring High School school performance profile.* Retrieved from http://paschoolperformance.org/Profile/5551

Philip, T.M. & Garcia, A. (2016). Schooling mobile phones: Assumptions about proximal benefits, the challenges of shifting meanings, and the policitics of teaching. *Educational Policy*, *29*(4), 676-707.

Project Tomorrow. (2014). *Trends in Digital Learning: Students' Views on Innovative Classroom Models*. Selected National Findings of the Speak Up 2014 Survey. Retrieved November 22, 2015, from http://www.tomorrow.org/speakup/2014_OnlineLearningReport.html

Puentedura, R. (2006). Transformation, technology, and education [Blog post]. Retrieved from http://hippasus.com/resources/tte/.

Quaglia, R.J. & Corso, M. J. (2014). The context for leadership. *Student voice: The instrument of Change* (pp. 155-168). Thousand Oaks, CA: Corwin.

Quaglia Institue for Student Aspirations (QISA). (2014). *My Voice National Student Report 2014*. A QISA Aspirations Research Center Study. Retrieved September 22, 2015 from http://www.qisa.org/dmsView/My_Voice_2013-2014_National_Report_8_25

Sheninger, E. (2014). Professional growth and development. *Digital leadership: Changing paradigms for changing times* (pp. 115-131) Thousand Oaks, CA: Corwin.

Storz, M.G. & Hoffman, A.R. (2012). Examining response to a one-to-one computer initiative: Student and teacher voices. *Research in Middle Level Education*, *36*(6), 1-18.

Sugar, W. & Slagter van Tyron, P.J. (2014). Development of a virtual technology coach to support technology integration for K-12 educators. *TechTrends*, *58*(3), 54-62.

Sullivan, A. (2012). Bourdieu and education: How useful is Bourdieu's theory for researchers? *The Netherland's Journal of Social Sciences, 38*(2), 144-166.

University of New England. (2012). IRB Reviewers 8-Point Analysis Form, Reviewer's Additional 6-Point Analysis Form for Children. Retrieved from http://www.une.edu/research/compliance/irb

Weston, M.E. & Bain, A. (2010). The end of the techno-critique: The naked truth about 1:1 laptop initiatives and educational change. *The Journal of Technology, Learning, and Assessment*, *9*(6), 1-25.

Wright, N. (2015). A case for adapting and applying continuance theory to education: Understanding the role of student feedback in motivating teachers to persist with including digital technologies in learning. *Teachers and Teaching*, *21*(4): 459-471.

Xiaoqing, G., Zhu, Y., & Guo, X. (2013). Meeting the "digital natives": Understanding the acceptance of technology in classrooms. *Educational Technology & Society, 16*(1), 392-402.

Zyad, H. (2016). Integrating computers in the classroom: Barriers and teachers’ attitudes. *International Journal of Instruction*, *9(1)*, 65-78.

APPENDIX A (Adapted from Hughes, et al., 2015)

This appendix includes the survey tool to be used in this study.

TECHNOLOGY USE SURVEY

Do you give your consent to participate in this survey?

- o Yes
- o No

SECTION 1- DEMOGRAPHIC INFORMATION

What is your gender?

- o Male
- o Female

What grade are you in?

- o Ninth grade
- o Tenth grade
- o Eleventh grade
- o Twelfth grade

SECTION II –TECHNOLOGY USE

This section will help us understand how much you use technology in and out of school and how good you are in using the technology.

A. COMMUNICATION ACTIVITIES

The first set of questions focus on technologies used for commuinication.

Do you currently use any of these communication tools for personal or school purposes? Check all that apply.

	Yes, I've done this	No, I've never done this
Read/Send e-mail	○	○
Read a blog, a wiki, or online discussion board	○	○
Comment on a blog, wiki, and/or discussion board **Write a blog or wiki**	○	○
Participate in text-based instant messaging (iChat, AIM, Gmail Chat, Facebook Chat, Twitter, Today's Meet)	○	○
Text messageon your phone	○	○

Participate in online audio/video interactions (Skype, Facetime, Google Hangouts, etc.)	○	○

Please tell us where you use this technology. Check any that apply.

	I use this in school	I use this outside of school	Both	Neither
Read/Send e-mail	○	○	○	○
Read a blog, a wiki, or online discussion board	○	○	○	○
Comment on a blog, wiki, and/or discussion board Write a blog or wiki	○	○	○	○
Participate in text-based instant messaging (iChat, AIM, Gmail Chat, Facebook Chat, private Twitter Chat)	○	○	○	○
Text messageon your phone	○	○	○	○
Participate in online audio/video interactions (Skype, Facetime, Google Hangouts, etc.)	○	○	○	○

B. WEB ACTIVITIES

The second set of questions focus on web-based tools.

Do you currently use any of these web tools for school or personal use? Check all that apply.

	Yes, I've done this	No, I've never done this
Use a search engine to find information (Google, Bing, Yahoo!, etc.)	○	○
View of listen to music and videos (YouTube, Netflix, Hulu, etc.)	○	○
Download music or videos (iTunes, Spotify, etc.)	○	○
Use the school or local library website	○	○
Participate in social networking websites (Facebook, Twitter, SnapChat, etc.)	○	○
Play video games online connected to other players (Halo, World of Warcraft, Runescape, Minecraft, Call of Duty, etc.)	○	○
Participate in online virtual worlds (Second Life)	○	○

Please tell us where you use this technology. Check any that apply.

	I use this in school	I use this outside of school	Both	Neither
Use a search engine to find information (Google, Bing, Yahoo!, etc.)	○	○	○	○
View of listen to music and videos (YouTube, Netflix, Hulu, etc.)	○	○	○	○
Download music or videos (iTunes, Spotify, etc.)	○	○	○	○
Use the school or local library website	○	○	○	○
Participate in social networking websites (Facebook, Twitter, SnapChat, etc.)	○	○	○	○
Play video games online connected to other players (Halo, World of Warcraft, Runescape, Minecraft, Call of Duty, etc.)	○	○	○	○
Participate in online virtual worlds (Second Life)	○	○	○	○

C. PRODUCTIVITY ACTIVITIES

The third set of questions focus on technologies used for productivity.

Do you currently use any of these productivity tools for school or personal use? Check all that apply.

	Yes, I've done this	No, I've never done this
Word Processing (Google Docs, Microsoft Word)	○	○
Spreadsheets (Google Sheets, Microsoft Excel)	○	○
Presentation Software (Google Slides, Microsoft PowerPoint, Prezi, Keynote, etc.)	○	○
Mind Maps (MindMeister, MindMups, Bubble.us, Inspiration, etc.)	○	○
Desktop Publishing (Microsoft Publisher, Comic Life, Google Draw, etc.)	○	○
Practice and/or quiz programs (Quia, Google Forms, etc.)	○	○

Please tell us where you use this technology. Check any that apply.

	I use this in school	I use this outside of school	Both	Neither
Word Processing (Google Docs, Microsoft Word)	○	○	○	○
Spreadsheets (Google Sheets, Microsoft Excel)	○	○	○	○
Presentation Software (Google Slides, Microsoft PowerPoint, Prezi, Keynote, etc.)	○	○	○	○
Mind Maps (MindMeister, MindMups, Bubble.us, Inspiration, etc.)	○	○	○	○
Desktop Publishing (Microsoft Publisher, Comic Life, Google Draw, etc.)	○	○	○	○
Pactice and/or quiz programs (Quia, Google Forms, etc.)	○	○	○	○

D. CREATION ACTIVITIES

The fourth set of questions focus on technologies that may support your creative side.

Do you currently use any of these tools for school or personal use? Check all that apply.

	Yes, I've done this	No, I've never done this
Create or change digital pictures or art (Photoshop, GIMP, Illustrator, iPhoto, Instagram)	○	○
Create or change digital audio (Aduacity, Garageband, Aviary)	○	○
Create or change digital video (Movie Maker, iMovie, Adobe Premier, WeVideo)	○	○
Share your creations (pictures, audio, video) online (Instagram, Flickr, Picassa, etc.)	○	○
Create or change web pages (Dreamweaver, Wix, Weebly, Google Sites, etc.)	○	○
Create Infographics	○	○

Please tell us where you use this technology. Check any that apply.

	I use this in school	I use this outside of school	Both	Neither
Create or change digital pictures or art (Photoshop, GIMP, Illustrator, iPhoto, Instagram)	○	○	○	○
Create or change digital audio (Aduacity, Garageband, Aviary)	○	○	○	○
Create or change digital video (Movie Maker, iMovie, Adobe Premier, WeVideo)	○	○	○	○
Share your creations (pictures, audio, video) online (Instagram, Flickr, Picassa, etc.)	○	○	○	○
Create or change web pages (Dreamweaver, Wix, Weebly, Google Sites, etc.)	○	○	○	○
Create Infographics	○	○	○	○

APPENDIX B

This appendix includes the focus group questions to be used in this study.

Student Focus Group Questions

1. Please describe how and where you typically use technology at school.
2. What role does technology play in helping you learn the material taught in class?
3. Within the context of your schoolwork, are there any technology tools or skills that you would like to have? What would these tools or skills allow you to do ... or do better?
4. What tools do you currently use that you feel benefit your learning?
5. Please describe the role- if any- that technology plays in your work with other students.
6. What do you think it means to be media literate? What do your teachers do that help students develop media literacy?
7. If you were to give your teachers suggestions on how to improve your learning with technology, what would you tell them?

APPENDIX C

This appendix includes informed consent documents.

Participant Outreach - Parent/Guardian (Survey)

Title of the Research Study: Improving Technology Integration in 1:1 Programs through Examination of Rural High School Students' Perceptions, Needs, and Experiences with Technology Integration

Dear Parent(s)/Guardian(s),

Your child has been invited to participate in a research study. The following information is provided in order to help you to make an informed decision whether or not to allow your child to participate. If you have any questions at any time, please do not hesitate to ask.

Your child is eligible to participate in this study because your child participates in the Big Spring School District 1:1 program. The purpose of this study is document students' perceptions of technology use in the classroom and their needs in relation to using electronic devices for learning so that these insights can be used to better inform instruction. This study will take approximately one half hour of your students' time. A survey be conducted in order to learn more about what technologies students are using, for what, and where they use these technologies.

This information will allow us to consider; how do students' at-home technology experiences differ from their experiences at school; how are learning experiences with technology different than other uses; how can technology be better leveraged for learning?

There are no known risks associated with this research. Any information obtained during this study which could identify your child will be kept strictly confidential. The information obtained in this study may be published in educational journals or presented at educational conferences, but the data will contain no identifying information.

Your child's rights as a research subject have been explained to you. You are free to decide not to enroll your child in this study or to withdraw your child at any time without adversely affecting your child's or your relationship with the investigator, Big Spring High School or the University of New England.

The researcher conducting this study is Brandie Shatto. For questions or more information concerning this research you may contact her at 717-215-7762 or bshatto@bigspringsd.org. The faculty advisor overseeing this research is Dr. Michelle Collay. She may be reached at 207-602-2656 or mcollay@une.edu.

If you have any additional questions concerning your child's rights, you have any questions or concerns about your rights as a research subject, you may call Olgun Guvench, M.D. Ph.D., Chair of the UNE Institutional Review Board at (207) 221-4171 or irb@une.edu.

Documentation of Informed Consent

You are voluntarily making a decision whether or not to allow your child to participate in this research study. If you consent to allowing your child to participate in this study, you DO NOT need to return this form. Your signature certifies that you do not allow your child to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

______________________________________ ____________________________

Signature of Parent **Date**

In my judgment the parent/legal guardian is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

______________________________________ ____________________________

Signature of Researcher **Date**

Participant Outreach - Parent/Guardian/Student (Focus Groups)

Title of the Research Study: Improving Technology Integration in 1:1 Programs through Examination of Rural High School Students' Perceptions, Needs, and Experiences with Technology Integration

Dear ____ (insert parent/guardian name),

You are invited to permit your child, (insert student name), to participate in this research study. The following information is provided in order to help you to make an informed decision whether or not to allow your child to participate. If you have any questions at any time, please do not hesitate to ask.

Your child is eligible to participate in this study because your child participates in the Big Spring School District 1:1 program. The purpose of this study is document students' perceptions of technology use in the classroom and their needs in relation to using electronic devices for learning so that these insights can be used to better inform instruction. This study will take approximately one half hour of your students' time. Focus groups will be conducted to document in-depth information about student perceptions of learning in a 1:1 environment. The Focus Group will:

- Encourage children to discuss their experiences with the 1:1 program.
- Include the aid of materials images, words and sticky notes.
- Use age appropriate questions and casual language in a comfortable setting (High School classroom).
- Include participants who know each other.
- Have session duration of less than one hour.
- Gather students in groups of six to ten during personal learning time (not core subjects)

This information will allow us to consider; how students experience learning with technology in our school; what are examples of technology-based activities that facilitate learning of value, from the students' perspective, and how could their experiences be improved?

We will also audio record the session for the researcher's use only. There are no known risks associated with this research. Any information obtained during this study which could identify your child will be kept strictly confidential. The information obtained in this study may be published in educational journals or presented at educational conferences, but the data will contain no identifying information.

Your child's rights as a research subject have been explained to you. You are free to decide not to enroll your child in this study or to withdraw your child at any time without adversely affecting your child's or your relationship with the investigator, Big Spring High School or the University of New England.

The researcher conducting this study is Brandie Shatto. For questions or more information concerning this research you may contact her at 717-215-7762 or bshatto@bigspringsd.org. The faculty advisor overseeing this research is Dr. Michelle Collay. She may be reached at 207-602-2656 or mcollay@une.edu.

If you have any additional questions concerning your child's rights, you have any questions or concerns about your rights as a research subject, you may call Olgun Guvench, M.D. Ph.D., Chair of the UNE Institutional Review Board at (207) 221-4171 or irb@une.edu.

Documentation of Informed Consent

You are voluntarily making a decision whether or not to allow your child to participate in this research study. Your signature certifies that you have agreed to allow your child to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

_______________________________________ ____________________________

Signature of Parent **Date**

_______________________________________ ____________________________

Signature of Student **Date**

In my judgment the parent/legal guardian is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

______________________________________ ____________________________

Signature of Researcher **Date**

Student e-mail to accompany survey

Dear Student,

You have been invited to participate in a research study. You are eligible to participate in this study because you participate in the Big Spring School District 1:1 program. The purpose of this study is document students' perceptions of technology use in the classroom and their needs in relation to using electronic devices for learning so that these insights can be used to better inform instruction. This study will take approximately one half hour of your time. The survey is being conducted in order to learn more about what technologies you are using, for what, and whether you use them more often at school or at home.

This information will allow us to consider; how do students' at-home technology experiences differ from their experiences at school; how are learning experiences with technology different than other experiences; and how can technology be better leveraged for learning?

You are in no way required to participate in this survey. You may skip questions that you do not understand or do not feel comfortable answering. You may opt out completely, if you choose, with no repercussions.

The researcher conducting this study is Brandie Shatto. For questions or more information concerning this research you may contact her at 717-215-7762 or bshatto@bigspringsd.org. The faculty advisor overseeing this research is Dr. Michelle Collay. She may be reached at 207-602-2656 or mcollay@une.edu.

If you have any additional questions concerning your child's rights, you have any questions or concerns about your rights as a research subject, you may call Olgun Guvench, M.D. Ph.D., Chair of the UNE Institutional Review Board at (207) 221-4171 or irb@une.edu.

Sincerely,

Brandie N. Shatto