

The Effect of Chromebooks on Disciplinary Literacy in the High School Social Studies
Classroom

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Table of Contents

Abstract..... 5

Introduction..... 6

 Topic and Research Problem 7

 Rationale 8

 Purpose..... 9

 Research Questions..... 10

Review of Literature 11

 Digital Technology in Schools..... 11

 Digital Literacy 15

 Disciplinary Literacy 17

 Definition 17

 Disciplinary Literacy in Social Studies..... 19

 Disciplinary Literacy and Technology..... 20

 Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge 21

 Summary 24

Methodology 24

 Participant Selection 25

 Participants..... 25

 Setting 26

 Positionality 26

 Methods of Data Collection 27

 Questionnaire 27

 Semi-Structured Interviews..... 27

 Observations 28

 Procedures..... 28

 Questionnaire 28

 Interviews..... 28

 Observations 29

 Trustworthiness..... 29

Data Analysis..... 29

 Finding One: On Both a District and Teacher Level, Preparation is Key to the Successful
 Implementation of a 1:1 Chromebook Initiative..... 30

Lack of infrastructure as a barrier 31

Teachers were not ready to Fully Utilize Chromebooks..... 33

Finding Two: The Chromebook Can Create a Seamless Educational Experience 34

 Google Classroom, Google Drive, and the Digital Binder 35

 Paperless classrooms create seamless lessons..... 37

Finding Three: The Chromebook can Function as a Tool for Fostering Independence and better
prepare Students for College..... 39

 The Chromebook as a tool for fostering student independence 39

 The Blackboard Movement..... 41

Finding Four: Teachers who have Committed to it have a Generally Positive Opinion of the
Chromebook as a Piece of Technology and a Tool for Enhancing Disciplinary Literacy 42

 Teachers that bought into the Chromebook 42

 Teachers with reservations about going paperless 44

 If the teacher buys in, the students buy in..... 45

Finding Five: The Chromebook can function as a Tool for Enhancing Disciplinary Literacy in Social
Studies..... 46

 The Chromebook aides in research 47

 The Chromebook allows for instant fact checking 48

 Kids becoming thinkers 49

Discussion 51

 Summary of Findings..... 51

 Conclusions..... 52

 Conclusion one: the biggest barrier to Chromebook implementation is people 52

 Conclusion two: the Chromebook is highly efficient with Google features 53

 Conclusion three: teachers approve of the Chromebook 54

 Conclusion four: the Chromebook can enhance disciplinary literacy in the high school social studies
classroom 54

 Implications..... 56

 For teachers..... 56

 Implications for students..... 56

 Implication for school districts 57

 Implication for my practice..... 57

 Limitations of this Study and Suggestions for Future Research 58

 Conclusion: The Overall Significance of this Study..... 58

References..... 60
Appendix A - Chromebook Research Questionnaire..... 66
Appendix B - Chromebook research – Interview Questions Template 71
Appendix C - IB HOTA Internal Assessment 73

Abstract

As the world grows ever more dependent on digital technology, so too does education. This qualitative case study examined a suburban school district in the northeastern United States implementation of Chromebooks as a piece of 1:1 technology. Specifically, this study narrowed its focus to concentrate on high school social studies classrooms. This study specifically looked at disciplinary literacy practices, and how the Chromebook affects those practices. The researcher observed, interviewed, and distributed questionnaires to the teacher participants. The data yielded five findings: preparation is key to the successful implementation of a 1:1 Chromebook initiative; the Chromebook can create a seamless educational experience; the Chromebook can function as a tool for fostering independence and better prepare students for college; teachers who have committed to it have a generally positive opinion of the Chromebook as a piece of technology and a tool for enhancing disciplinary literacy; and the Chromebook can function as a tool for enhancing disciplinary literacy in social studies. This study concludes by discussing the conclusions and implications drawn from those findings.

Introduction

Over the past few decades, humanity has witnessed an exponential growth in technological capabilities, stemming from the proliferation of digital technology. This digital technology influences many facets of contemporary human life, including the field of education. Many schools attempt to incorporate new technology into their curriculum, and train their teachers to infuse technology into their pedagogy. Although some skeptics remain, the vast majority of research supports the notion that technology is beneficial for students if properly utilized (Hutchison & Woodward, 2014, 2014; Neumann, 2016; Pacino & Nofle, 2011; Zheng, Arada, Niiya, & Warschauer, 2014). Many school initiatives attempt to increase technological integration, with programs such as the 1:1 initiative, with varying degrees of success (Zheng et al., 2014). Many school districts across the country have implemented 1:1 technology initiatives with various pieces of technology (Demski, 2012). Schools design these programs to benefit students, so educators must conduct research to evaluate their effectiveness. Specifically, researchers should evaluate if technology improves instruction and incorporates literacy skills specific to the discipline taught. This concept of disciplinary literacy needs to guide the evaluation of technology use in classrooms.

The goal of a 1:1 initiative is to get digital technology into the hands of every student. Instead of class sets, or computers in the library, each student receives their own device from the school district to use for the school year. School districts use a wide assortment of technology for this initiative, from various brands of laptops, to tablets and iPads (Demski, 2012). The focus of this research study will be on a suburban school district in the Northeastern United States with the pseudonym of Genesee School District. Genesee started their own 1:1 initiative with iPads in 2013-2014. That school year, every fifth and sixth grader received a school-issued iPad. The

following school year, they expanded the initiative to grades 5-8. Originally, Genesee planned to have an iPad for every student grades 5-12 by the 2017-2018 school year. However, following the 2015-2016 school year, the district decided to make a change, and replaced the iPads with Google Chromebooks. This research study evaluates the Chromebook as a tool for enhancing disciplinary literacy by examining high school social studies classrooms.

Topic and Research Problem

The iPad first became commercially available in 2010. Since then, numerous researchers have conducted a wide variety of studies examining the effectiveness of the iPad in schools from elementary to college. They examined the iPad from a multitude of viewpoints in various classrooms and analyzed the benefits of the iPad, along with potential pitfalls that teachers may encounter. For this study, it is important to note that many preexisting studies offering data on the iPad in the classroom exist (Baker, Isbell, Wendt, & Wilson, 2013; Flewitt, Kucirkova, & Messer, 2014; Hutchison, Beschorner, & Schmidt-Crawford, 2012; Hutchison & Woodward, 2014; Northrop & Killeen, 2013; Simpson, Walsh, & Rowsell, 2013). While there is plenty of room for more research on iPads in classrooms, the literature continues to grow. The same is not true of the Chromebook, despite the fact that both products have been commercially available for a similar length of time (“A new kind of computer,” 2011, “Apple launches iPad,” 2010). This leaves a need for research on Chromebooks in classrooms.

Research exists that establishes a context for laptop use in the classroom, from 1:1 initiatives to general use, that focus on both constraints and benefits of laptops in the classroom (Keppler, Weiler, & Maas, 2014; Kervin, Verenikina, Jones, & Beath, 2013; Tallvid, Lundin, Svensson, & Lindström, 2015; Zheng et al., 2014). However, unlike with iPad research, laptop research tends to be less specific in that a large variety of laptops exists, but research tends to

generalize them, whereas the iPad is one specific brand (Hutchison et al., 2012; Zheng et al., 2014). For example, Neumann (2016) addresses concerns with teaching technology to digital natives and reports generalized findings that refer to device use as “technology” as opposed to a specific device (p. 105).

Not much research exists on brand specific research for laptops. Yes, a Chromebook functions very similarly to a laptop, but the Chromebook has many specific features that make it different from a typical laptop, such as its touchscreen capabilities and its reliance on internet access. Therefore, when Genesee School District made the switch from iPads to Chromebook they picked a piece of technology that does not have as much existing research-based literature specific to that device. Therefore, my research explored the manner in which the Genesee School District implemented Chromebooks in the classroom; in this case, the specific model is the Dell Chromebook 11. My research study aimed to discover what kind of effect, if any, the Chromebooks would have in the classroom to help Genesee School District make future decisions about the technology. As such, this research study aimed to evaluate the effectiveness of the Chromebook as an educational tool that helps to incorporate disciplinary literacy practices in the classroom by examining the Chromebook’s use in Social Studies classrooms.

Rationale

A fear shared by many researchers and educators, including myself, is teachers use technology just for the sake of using it, as opposed to using technology to enhance their content and pedagogy (Flewitt et al., 2014; Hutchison & Woodward, 2014; Zheng et al., 2014). As Kervin et al. (2013) stated, the research needs “to investigate the ways technologies are currently used by literacy teachers to support pedagogic activity and the complexity of interdependent factors that affect the process” (p. 135). My research study applied the above ideology to the

teachers of the Genesee School District, with particular attention paid to the teachers' disciplinary literacy instruction. This focus on if Chromebooks support disciplinary literacy will interrelate the technology with important foundational pedagogy. Disciplinary literacy extends beyond basic reading comprehension strategies or searching for the main idea (Wineburg & Reisman, 2015). According to Learner (2015), disciplinary literacy involves skills and interactions that are specific to each discipline, the students make interpretations and evaluations that are discipline-specific, thus learning to think like a historian, mathematician, or scientist. My research paper focuses on disciplinary literacy in social studies, and what effect the Chromebooks have on disciplinary literacy instruction in a social studies classroom.

Disciplinary literacy in social studies was the primary focus of this research because at Genesee High School, a number of social studies teachers actively used the Chromebook daily as a part of their instruction. In addition, my personal experiences as a teacher have taught me that disciplinary literacy is highly important in social studies in order to help students make sense of both primary and secondary sources. Disciplinary literacy in social studies also teaches students how to evaluate knowledge and data, and discern credible sources from false or malicious ones (Wineburg & Reisman, 2015). Therefore, social studies became a logical choice to fit both aspects of my research study. The research for this study used social studies to evaluate the Chromebook as a tool, and add to the existing literature to help schools determine the Chromebooks viability as a tool for providing disciplinary literacy strategies and instruction. The literature review section will provide a thorough definition of disciplinary literacy.

Purpose

The purpose of this study is to expand upon the existing research available to schools exploring the potential use of Chromebooks in the classroom to enhance disciplinary literacy in

social studies. Currently, schools can gather the expert opinions of administrators who have already implemented 1:1 technology programs or read their opinions in collections put together by others (Demski, 2012). Schools should have research available that specifically addresses different pieces of technology when considering which type of technology to implement in their 1:1 initiative. If a school district intends to implement a 1:1 initiative, they have many choices to make, including what device best fits the needs of their students, and therefore it may be useful for the schools to access research as well. This study might provide schools with research upon which to base their decisions.

This study also strived to provide an opportunity for teachers to consider the purposes for which they incorporate technology into their classrooms. I collected data from teachers in order to determine if the Chromebooks have any impact on the teaching of disciplinary literacy. Studies such as mine, along with any past or future similar studies, will ideally get teachers to consider how they use technology in their classrooms. Teachers need to ask themselves the question: I am just familiarizing my students with a new technology, or am I using that technology to enhance my lessons and offer students the opportunity to interact with the material in new and exciting ways? Teachers should also examine how they teach disciplinary literacy in their classrooms by examining if their lessons prepare students to be better citizens. This study examined if the Chromebook is efficient at accomplishing both these tasks, and if they can become synonymous with one another.

Research Questions

This paper seeks to address the effectiveness of Chromebooks when used by teachers as a tool for disciplinary literacy. To achieve this, I conducted research by observing and

interviewing teachers, as well as distributing a questionnaire. I rooted the research in the following questions:

- Do Chromebooks affect disciplinary literacy in high school social studies classrooms, and if so, how?
- What is the professional opinion of teachers on the Chromebook as a tool for enhancing disciplinary literacy?

Review of Literature

This literature review will discuss digital technology in schools, digital literacy, disciplinary literacy, and a pedagogical framework called TPACK. The first section describes the history and evolution of digital technology in the school classroom, including legislation that pushes for increased digital technology use in classrooms. Next, the literature review shall consider two forms of literacy that interrelate with each other in most classrooms. The first is digital literacy, which is far more expansive than being able to use digital technology. Second is disciplinary literacy, or the skills and strategies specific to a discipline. All of this ties into the theoretical framework known as TPACK (Technological Pedagogical and Content Knowledge).

Digital Technology in Schools

As new technologies develop, society works to incorporate them into schools in order to prepare students for the workforce, as well as using the equipment to enhance learning. Schools saw perhaps their most radical evolution over the past couple of decades thanks to the advent and widespread use of digital technologies. Once developers adapted personal computers for home use in the late seventies, it did not take long for education to begin to recognize the importance of digital technology (Weyhrich, n.d.). Therefore, the history of this technology movement is instrumental to my research because it is important to understand the context of how schools got

to the level of technology integration that they have today. An understanding of this history emphasizes the importance of technology's impact on disciplinary literacy in the classroom.

Computer science became a recognized and important school concept in a 1983 federal report entitled *A Nation at Risk* (U.S. Department of Education, 1983). This report detailed that schools should focus on teaching fundamental computer skills to students, citing it as one of the five new basic skills that high school graduates need to be successful (Culp, Honey, & Mandinach, 2005; U.S. Department of Education, 1983). Within ten years of the personal computers widespread use, education began to recognize their importance, thus computer use continued to expand in classrooms as the technology evolved.

In 2001, President George W. Bush passed into law the No Child Left Behind Act (NCLB). Unlike *A Nation at Risk*, which served as a report, the NCLB was law. The legislation "included a recommendation that by the eighth grade all students should be technologically literate and repeatedly references technology as an important source of support for teaching and learning across the curriculum" (Culp et al., 2005). Here, the NCLB continued to discuss the importance of digital literacy. As opposed to part of a report, teaching students how to work with digital technology now had federal funding attached to it. Another important consideration is that it mentions more than digital literacy or computer science. The NCLB wanted teachers to use digital technology as a means of enhancing curriculum and their own pedagogy. This idea will help to evolve the role of digital technology in schools over the next fifteen years, and spearhead many initiatives in school districts across the United States. Such initiatives are important to this study because they are responsible for 1:1 technology integration, and at Genesee high school, it shifted the nature of the classroom to include the Chromebook as an integral tool to the educational process.

Over the past several decades, digital technology has rapidly advanced. In 2001, when legislators drafted NCLB, the most advanced digital technology for schools was laptops that teachers could cart from room to room. As a student in middle school at the time, I can remember everyone's excitement at the laptop carts that the teachers could sign out and wheel to their classrooms. However, within ten years, that technology rapidly advanced to include smaller and more powerful mobile devices such as smartphones, and items with touchscreen capabilities such as tablets and certain brand laptops, such as the Dell Chromebook 11. The internet progressively became more instrumental to schooling as well.

As technology expanded, states began to draft legislation to incentivize local school districts to begin 1:1 initiatives, which held the goal of getting a piece of new, digital technology in the hands of every student. In 2012, Idaho began working to get every public school student and teacher a laptop, while Florida began to put policies in place that would require schools to spend portions of their budgets on digital content (Zheng, Arada, Niiya, & Warschauer, 2014). At the federal level in the same year, "the US Department of Education and the Federal Communications Commission... unveiled a plan to switch schools to digital textbooks by 2017" (Zheng et al., 2014, p. 279). Research supports the use of digital technology as a tool to maximize instruction since its inception in the 1980s as well (Keppler et al., 2014). This research and this push at the state and local levels helped convince school districts to look into different pieces of technology for their 1:1 initiatives.

As 1:1 initiatives gained more traction, higher percentages of schools began to implement a wide variety of 1:1 initiative programs (Downes & Bishop, 2015). Genesee School District began their 1:1 initiative with iPads in 2013. Genesee was not the first district to have such an initiative however; as various districts across the country began implementing 1:1 initiatives as

early as 2009 (Demski, 2012). These districts also chose different brands and pieces of technology, and not just iPads. Districts across the country implemented 1:1 initiatives with various devices such as iPads, Android Tablets, Macbook Pros, Netbooks, Chromebooks, and Dell Laptops. Despite the wide variety of devices implemented, administrators from these various districts cited very similar reasons for their choices with cost, creativity, and ease-of-use being amongst the most commonly cited deciding factors (Demski, 2012).

Many districts are now multiple years into their 1:1 initiatives, and thus, should begin to look at several key factors of their programs. Regardless of the device, it takes teachers and students time to get used to new technology, and this unfamiliarity frequently serves as a barrier in education when teachers and students begin working with a new device (Hutchison & Woodward, 2014; Neumann, 2016; Park & Burford, 2013). After teachers overcome this obstacle, they can begin to examine how their devices can enhance the disciplinary literacy skills of their students.

The Genesee School District is an example of a school district that developed a 1:1 initiative because of the evolution of digital technology and the legislation that pushed for it. Genesee began their 1:1 initiative thanks to a grant they secured, providing the funds to purchase the iPads, and eventually the Chromebooks. The grants are possible due to legislation that started with NCLB. Therefore, Genesee could also serve as a case study of how digital technology impacts schools, from administrators to teachers to students. These laws are important to this study because Genesee acquired these Chromebooks through an initiative that stems from these developments.

Digital Literacy

Just as the history of 1:1 technology is important, so is how students use that technology. According to Pacino and Nofle (2011), literacy means more than reading and writing. It involves one's ability to be a self-reflective, critical thinker capable of making informed decisions in society. However, the advent of the internet over the past two decades redefined and expanded upon this definition. Pacino and Nofle (2011) continue to discuss how schools, parents, and teachers must rally together to expand this definition to cover print and non-print formats so that students can use the digital tools available to them to be thoughtful contributors and consumers in society. This concept is similar to disciplinary literacy skills in social studies, and students need to be able to use technology to achieve those means. The teachers in this study must not only teach students' digital proficiency, but how to use the technology to enhance their educational experience as well.

Digital tools add a new element to the definition of literacy. Park and Buford (2013) describe the difference as such:

Digital media literacy is a useful concept that frames the broad set of skills that are essential in using digital technologies. In contrast to traditional media literacy, where the main skills required are the capability to access, consume, and interpret content, digital media literacy adds the dimension of user participation; the ability to create, re-use, and disseminate content. (p. 268)

The element of user participation is important for teachers to consider, as students need to familiarize themselves with the digital tools at their disposal. Therefore, access is paramount. The ability of students to consume content successfully requires that they have constant access to digital technology in order to improve their rapport with the device. It takes time for the student

to learn how to use the technology to improve their critical thinking skills and disseminate information from their devices in an academic manner (Tang & Chaw, 2016). According to Park and Burford (2013), if a student spends a year or more with a new device, they will demonstrate an improved and enhanced level of digital media literacy. Park and Burford (2013) add that even non-academic use of devices, such as gaming and social networking, improves a student's digital literacies. Research such as this supports the decision some schools have made to give the students 24:7 access to their devices.

Limited access to and limited knowledge of digital technology can become a barrier to instruction, especially with the "digital learners" of today who have grown up with digital technology as commonplace. According to Neumann (2016), today's students sometimes lack the patience to search the web properly for information while doing research, and then have difficulty discerning the credibility of the sources they find. Due to the speed of digital technology, many of today's students are accustomed to instant gratification, and are unwilling to search past the first page of a list of results. Teachers also cite plagiarism as a major issue with their students. In order for students to develop their digital literacy foundation, they must first learn these academic digital skills (Neumann, 2016; Tang & Chaw, 2016).

According to Tallvid et al. (2015), other barriers to a student's digital literacy development include unsanctioned use of personal devices. This problem is very common in 1:1 programs. Students will use their devices for non-academic pursuits such as gaming and social networking. This becomes a problem because students will do so during class time instead of engaging in academic tasks. Additionally, research suggests that frequently off-task students are unlikely to adopt better behaviors. Although these students will still become more proficient

with their devices, they will not develop the skills to consume technology as an informed citizen. (Tallvid et al., 2015)

Despite these potential pitfalls noted about digital technology, a digitally literate student is a better student. The risks are worth the rewards (Hutchison & Woodward, 2014). It is important that a student can adequately consume the digital technology and apply it their studies, and teachers' aide them in doing so. The teacher participants of this study need to be mindful of how their students use the Chromebooks in their classrooms. However, educators must also consider the literacies within the disciplines that they teach as well.

Disciplinary Literacy

Definition. If students actively consume technology and use it to disseminate information, then teachers have already provided the groundwork for disciplinary literacy skills in social studies. There are many basic reading strategies that a teacher can teach to a student to help them through difficult texts. Content area literacy is the set of skills students have to study and learn from texts specific to subject matter, while disciplinary literacy is the knowledge and abilities used within the disciplines to create and communicate (Shanahan & Shanahan, 2012). Content literacy skills are generalizable strategies applicable across a variety of subjects. These skills may involve such strategies as making inferences, asking questions, and determining important information. Content literacy is adaptable across subjects (Lerner, 2015). Over the past quarter century or so, the need for literacy infusion into content classes has grown. However, the old adage of building up a student's reading skills and strategies will help them understand their content does not meet the needs of high school students, and can frustrate secondary teachers. Adolescent literacy rates have not improved under this model, and a need existed for a new approach (Shanahan & Shanahan, 2008). Teachers tend to scoff at the idea of

teaching reading, and can miss the opportunity to infuse skills specific to their discipline to help students grow (Gillis, 2014).

There are many reasons that students struggle with content in high school. Many researchers look at still developing basic reading skills for this, and push for better reading instruction and practices (Fisher & Frey, 2014; Whithear, 2011). Though helpful, content difficulties run deeper than basic reading skill. The problems stem from students struggling to interpret discipline specific text. The vocabulary and content becomes more discipline-orientated in middle and high school, thus teachers need new strategies to help their students tackle these tough texts. Generalizable reading strategies, or content literacy, are helpful but may not be enough (Shanahan & Shanahan, 2008). Strategies that attempt to incorporate social studies disciplinary literacy skills are also helpful for closing achievement gaps in social studies (Reisman, 2012).

Shanahan and Shanahan (2008) describe a model of literacy progression that functions as a pyramid where one must build on each level that comes before. The first level is basic literacy, which consists of the knowledge and decoding skills for the basic words of the English language that are prevalent across all subjects and in common conversation. The next stage is intermediate literacy, or the “literacy skills common to many tasks, including generic comprehension strategies, common word meanings, and basic fluency” (p. 44). The final tier of the progression model is disciplinary literacy, which is the “literacy skills specialized to history, science, mathematics, literature, or other subject matter” (p. 44). The intermediate level is text decoding and comprehension strategies that a student needs to work through difficult texts. The discipline specific skills are the next level that build off those skills. To progress to the top of the pyramid, students need strategies specific to each discipline.

Disciplinary literacy serves as a framework to guide adolescent teachers. Shanahan and Shanahan (2008) created the seminal framework in 2008 that serves as an overview of what disciplinary literacy is and what it should look like. They revisited the framework and discussed it again in 2012. The two recognized the issue of poor literacy performances in the middle and high school levels, despite increased performance in elementary levels, and set out to address it. This study examines if Chromebooks affect disciplinary literacy instruction in the classroom. Specific disciplinary literacy skills exist for each subject, but this research focuses on the skills in social studies disciplinary literacy.

Disciplinary Literacy in Social Studies. Disciplinary literacy in social studies serves not only to get students to think like historians, but to get them to develop into responsible and informed citizens (Wineburg & Reisman, 2015). According to Wineburg and Reisman (2015), the ability to properly source material is vital to this citizenship, lest they lack the ability to discern the credibility of the sources they will come across in today's digital age. Students will find historical information throughout mass culture as well, and the ability to recognize and interact with historical content from video games and movies serves as both a motivational tool for students as well as a skill to build (Waring & Robinson, 2010).

The need for disciplinary literacy skills in social studies extends beyond creating better citizenship, but stems from the Common Core State Standards (CCSS) as well. The CCSS contains multiple references to literacy skills in social studies, requiring students to interact with texts to learn and disseminate information ("Common Core State Standards Initiative," 2016). Researchers now recognize that due to the CCSS, a shift in instruction is necessary to meet these standards, and disciplinary literacy skills best satisfy the standards (Draper, 2015; Gilles, Wang, Smith, & Johnson, 2013; Shanahan & Shanahan, 2014). Social Studies disciplinary literacy

serves to meet common core state standards, and thus prepare a well-informed citizenry that can interpret historical context from the world around them as well as properly determine the appropriateness of sources of information that they will discover in the digital age.

Dobbs, Ippolito, and Charner-Laird (2016) conducted research at a high achieving school and discovered that students initially struggled with disciplinary literacy concepts, such as finding the main idea of a source. This surprised the team of teachers in their study, who had spent summer workshops discussing how to incorporate disciplinary literacy skills into their classroom. Dobbs et al. (2016) determined that it is necessary for teachers to layer intermediate skills into disciplinary instruction, and essentially scaffold up to larger skills. Gillis (2014) discusses some of these strategies, such as sourcing information, determining viewpoint and bias, comparing to related documents and contextualizing, amongst other skills.

Some researchers took disciplinary literacy skills and applied them to specific disciplines. Monte-Sano, De La Paz, and Felton (2014) delve into some of the larger skills and strategies successfully used by an effective social studies teacher. They break disciplinary literacy in social studies into the categories of reading and writing, and suggest that teachers should focus on skills and strategies for both. However, it is imperative to offer teachers professional development opportunities to refine and remaster how to teach these concepts into their classroom (Monte-Sano et al., 2014).

Disciplinary Literacy and Technology. Disciplinary literacy goes hand-in-hand with digital literacy. Digital technologies offer teachers an opportunity for students to interact with sources in new and creative ways while enabling the instruction of new strategies. Wickens, Colombo, and Glover (2015) provide an example of this. In their study a teacher running a blog, and having students' complete assignments as responses to the blog. The teacher found many

benefits to this strategy. She discovered that the creation of an “authentic audience” (Wickens, et al., 2015, pg. 30) made students more weary of the responses they gave. The blog also created the opportunity for new student interactions, including discussions amongst students about the topics. It also made her, the teacher, more conscious of her own instruction. This is just one example of the many benefits of digital integration in disciplinary literacy (Wickens et al., 2015).

The importance of disciplinary literacy skills in today’s digital age delves deeper than new ways to interact with content, as there are many dangers in today’s digital age of information. According to (Wineburg & Reisman, 2015), the main reason for this is the ability to source documents. For example, teachers in California gave students a test they thought to align with disciplinary based state standards. They provided a document from a holocaust-denying Aryan supremacy group but did not have it properly sourced, and students found that one most believable. There is such a vast amount of information available today thanks to computers and digital technology, that teachers must prepare students to become digital citizens that can actively disseminate and determine the credibility of the sources that they will come across. As stated by Wineburg and Reisman (2015), “In a democracy, the ill-informed hold as much power in the ballot box as the well-informed” (p. 638). In our society, people can vote regardless of how well educated they are and what their decision making skills are. Disciplinary literacy skills will help students become more well-informed citizens. My study examines teachers’ ability to use their district-mandated technology (Chromebook) as a tool for developing digital and disciplinary literacy.

Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge

The technological pedagogical content knowledge (TPACK) framework addresses the balancing of technology with a teacher’s preexisting pedagogy and delivering of content

knowledge (Mishra & Koehler, 2006). Please note, that in Mishra and Koehler's seminal framework, they refer to technological pedagogical content knowledge with the acronym TPCK. They since have adapted it to TPACK, and it is cited in other works as such (Hutchison et al., 2012; Hutchison & Woodward, 2014). Mishra and Koehler (2006) looked at how the use of technology was increasing in schools, without a real consensus on how to use it. They blamed the lack of a theoretical grounding, and set out to develop that framework.

Shulman (1986) first developed the idea of pedagogical content knowledge (PCK). In his framework, he takes two main aspects of teaching, content and pedagogy, and discusses how the two must overlap. Teachers are responsible for the content they teach, or all the knowledge students need to learn, and their pedagogy, or the strategies they use to ensure that students learn that content. PCK says that content and pedagogy are not mutually exclusive of one another. Essentially, content and pedagogy are each their own circle. From those two circles, PCK creates a Venn-Diagram of content and pedagogy. The overlapping area is PCK, and where teachers should strive to be.

In 1986, when Shulman designed his PCK framework, digital technologies were still a relatively new addition to classrooms, and not at the forefront of educational discussion like it is today. Therefore, Mishra and Koehler (2006) recognized the need to expound upon the PCK framework. Teachers had their pedagogy and content, but technology was absent. In general, very little consensus existed as to how to utilize digital technology properly. A problem in education is that teachers sometimes use technology such as laptops just for the sake of using it, without considering how it enhanced their content or pedagogy.

Mishra and Koehler (2006) used the same idea for TPACK that Shulman used for PCK. They took the Venn-Diagram of content and pedagogy, and created a third circle, technology.

To be more specific, Mishra and Koehler (2006) refer primarily to digital technologies such as computers and the internet, but simply pair it down to technology in general. The circle of technology overlaps the circles of content and pedagogy, creating a 3-circle Venn-Diagram.

Mishra and Koehler (2006) provide a visual, similar to the one below:

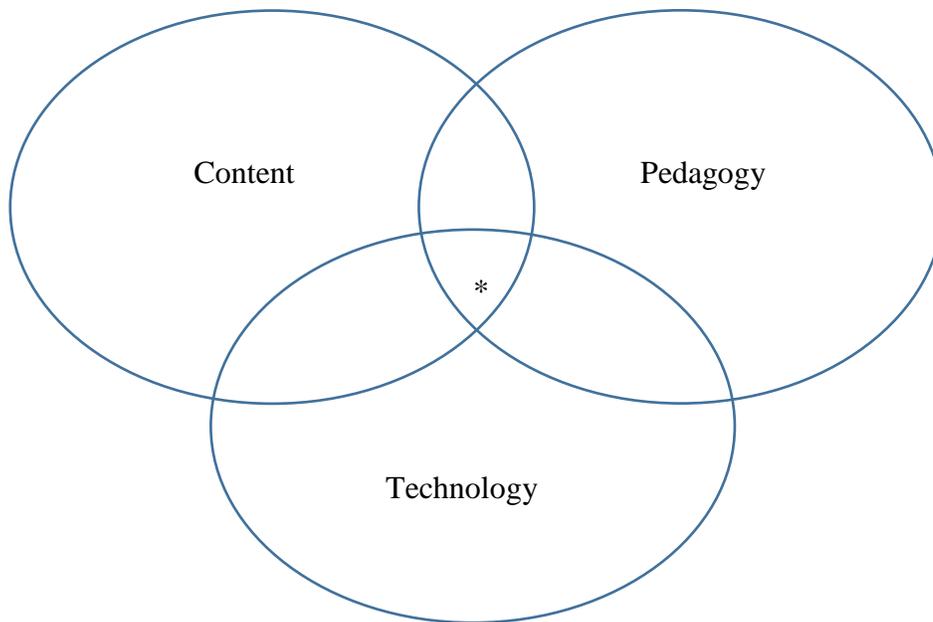


Figure 1: TPACK Venn-Diagram (Mishra & Koehler, 2006, p. 1025)
* = Technological pedagogical content knowledge

As the above visual suggests, the framework operates under the idea that content, pedagogy, and technology overlap and are not mutually exclusive of one another. When teachers use technology in their classrooms, they should consider how it would enhance their content and their pedagogy. Technology cannot be its own individual circle if teachers are to maximize its benefits. The technology must enhance the pedagogy, and good pedagogy should involve technology, helping to make students more digitally literate in the process. The technology offers new, exciting ways for kids to learn the content, allowing students to become consumers of the content (Mishra & Koehler, 2006). This interrelationship of technology, pedagogy and

content serves as the grounded framework for my research study, with the content and pedagogy being social studies and disciplinary literacy focused.

Summary

The four sections of this literature review form the basis for this research study. This research study has two guiding concepts, technology and disciplinary literacy. The first two sections of the literature review, technology in schools and digital literacy discuss the importance of technology in schools. Technology in schools provides the history of how a school like Genesee High School made the decision to give each student a Chromebook. Digital Literacy provides the framework for why it is important to have digital technology such as Chromebooks integrated in the classroom. Disciplinary literacy is the instructional practice that teachers should use because it effectively teaches student how to handle complex content. The TPACK framework ties all of this together by infusing the technology into the content and pedagogy. I will use this literature to guide my data analysis and discussion.

Methodology

This qualitative case study examined the methods and opinions of experienced social studies teachers that utilize Chromebooks in their high school classrooms. I collected data via three different data sources: questionnaire, semi-structured interviews, and observations. I obtained all data points in the middle of the school year, at the beginning of the second semester. This gave the teachers adequate time to form opinions and experiment with the Chromebooks in their first year of use.

Participant Selection

The participants of this study were all social studies teachers at Genesee High School. Genesee school district was a highly regarded district that teachers often left other districts for; therefore, the staff is full of experienced teachers.

In order to answer the research questions, the selection of only social studies teachers to participate was appropriate. I wish to note however, that the school utilized Chromebooks in all subjects, and researchers could obtain great data if they studied other subject areas. The teachers also all worked at the High School, although qualified teachers worked at the middle school and elementary schools as well that work with Chromebooks, I simply focused on high school classrooms. I functioned as the only researcher that conducted the interviews, distributed the questionnaires, and performed the observations.

Participants. The research had six participants. Participant one completed the questionnaire, the interview, and the observation. His pseudonym was Jim. He was a Global 9 teacher, and regarded as somewhat of an authority on the Chromebooks and technology. Participant two's pseudonym was Josh. He completed the questionnaire and I observed him. He also taught Global 9. Participant three taught United States history to juniors, a class known as IB HOTA (International Baccalaureate History of the Americas). I observed him and his pseudonym was Greg. Participant 4 was a female Global 9 teacher with the pseudonym of Amanda. She completed an interview with me. Participant 5 was a female IB HOTA teacher. She also taught Government and Economics to seniors, but that grade did not have their own Chromebooks. Her pseudonym was Melissa. Participant six taught Special education and had a US History class. He also taught other subjects, such as math. His pseudonym was Craig. He

completed a Questionnaire and I observed one of his lessons. All of the participants were veteran teachers with years of experience, although participants 2 and 3 are new to Genesee.

Setting

Genesee High School was the pseudonym of the high school that served as the setting for this study. It was a large suburban high school, serving grades 9-12. At the time of the study, the high school had 1,404 students. The racial makeup of the school was 91.0% White, 3.4% Hispanic, and 2.4% African-American. 18.7% of students were eligible for free or reduced price lunches. In 2016, the school finished in the 89th percentile of all New York State schools for statewide performance. This information came from a free online data source (“SchoolDigger.com,” 2017).

Positionality

I was in a unique position that affected my role as researcher. I was a single white male in my mid-twenties, and a master’s candidate for the Literacy Program at the College at Brockport, State University of New York. One of my goals in conducting this research was to complete my capstone thesis and obtain my Master’s degree.

On top of being a graduate student, I worked full time at Genesee high school, but not in my own social studies classroom. During the completion of this research, I worked for Genesee high school as the In School Suspension Supervisor. My job was to oversee students that the school suspends in school, and tutor them on their missed work. This means I already knew the participants prior to beginning the research. I was also aware of the policies of the school district, and was prior to starting my research. Because of this, I had bias in the form of preconceived notions of the participants teaching styles as well as the curriculum for the school.

I aimed to set my preconceived notions aside, and conduct research based only on the data collected.

Although I did not work in a social studies classroom, I held certifications to teach inclusive social studies in New York State in grades 5-12. Therefore, I had the preexisting background knowledge to have discussions with the participants about the teaching of social studies. I also had experience working in special education, having worked as a 1:1 aide for a student with autism in the past, as well as working as a counselor at a summer camp for kids with special needs.

Methods of Data Collection

I conducted a qualitative study where I collected data through questionnaires, semi-structured interviews, and observations.

Questionnaire. The questionnaire served to gather general opinions on the Chromebooks as a tool for enhancing disciplinary literacy, and allowed me to collect data in such a fashion that I had easily coded data. I designed the questions myself to fit the needs of this study by ensuring that they addressed my research questions (Clark & Creswell, 2015; Shagoury & Power, 1999).

Semi-Structured Interviews. To conduct the interviews, I drafted a preexisting set of baseline questions to guide the semi-structured interview. I recorded the interviews via a voice recorder app on my cell phone. I conducted the interviews as a conversation, asking following up questions as warranted. I conducted five interviews that lasted about 20 minutes each. I conducted the interviews on school grounds, usually in the classroom of the participant, although Melissa's interview occurred in a cafeteria (Clark & Creswell, 2015; Shagoury & Power, 1999).

Observations. The observations occurred in the classroom of the participant as they taught, for each participant. I sat in the back of the classroom, where I would be the least distracting, and took anecdotal notes on the lesson. I observed Global 9 and US History lessons. I had a brief conversation with the teacher before the lesson about what to expect during the lesson, as well as asked any follow-up questions afterwards, only for my own clarification (Clark & Creswell, 2015; Shagoury & Power, 1999). With Craig's observation, we had a debriefing and further discussed the Chromebooks.

Procedures

This section will explain the procedures I used in the research. I recruited the participants for this study via email. I explained the three methods of data collection, and gave the participants the option to participate in all three data points, or just one or two if they prefer. I then had follow up conversations in person or via email to answer any questions or concerns for those that expressed interest in being a participant.

Questionnaire. For those that chose to participate in the questionnaire, I printed off copies of the questionnaire and placed it in their mailbox in the main office or hand delivered it to them, depending on the participant's personal preference. After receiving the responses, I tallied up similar responses and coded all the comments to find similarities as well as differences. I also wrote a personal summary and reflection for myself, to help me personally understand and interpret my own data.

Interviews. I scheduled the interviews with each participant either through email or by discussing it with them in person, depending on the participant. I conducted two of the interviews in the participant's classroom and another one in the cafeteria where they supervised a study hall, and recorded it using a voice recorder app on my cell phone. After completing the

interviews, I transcribed each interview so that I could examine and compare them. I then went through and coded the data so I could draw comparisons and differences.

Observations. For the observations, I sat with the participants to determine when they planned on teaching a lesson that would allow me to observe extensive Chromebook use. I sat in on those lessons and took anecdotal notes. I compared those anecdotal notes and coded them as raw data to find more results. I looked at each set of data points individually to see what each told me, and then cross-analyzed all three to determine if my observations provided similar results to the teachers opinions.

Trustworthiness

I maintained trustworthiness in my study through the triangulation of my data. I obtained data from three different data methods and multiple data sources. I corroborated my data amongst different methods and sources (Clark & Creswell, 2015). I also engaged in member checking, where I took my interpretation of the data analysis and asked my participants if they agreed with the finding (Clark & Creswell, 2015).

Data Analysis

After collecting my data, I followed the five steps outlined by Clark and Creswell (2015). I prepped the data first, transcribing my recorded interviews into a word document. After that, I explored the data, familiarizing myself with the data and gaining a gist of what I needed to look for. Next, I developed a list of codes, and began to code my data. I specifically used visual markers as suggested by Shagoury and Power (1999) and highlighted all the physical copies of my data. I had questionnaires, transcripts of my interviews, and physical notes from the observations. I then highlighted bits of data in the color that corresponded with its code. I then

used those codes to develop themes, which became the basis for my findings (Clark & Creswell, 2015; Shagoury & Power, 1999).

As I analyzed my data, I realized I needed to address more than just the straightforward answer to my research questions. I needed to examine the bigger picture of the Chromebook as a general educational tool to determine the impact it had on disciplinary literacy in a high school social studies classroom. With that in mind, my findings reached beyond the realms of a straightforward response, with the intent of providing an overall view of the capabilities and limitations of the Chromebook. Knowing these capabilities and limitations is necessary to evaluate the Chromebook as a tool for enhancing disciplinary literacy. With this in mind, my data revealed five findings, which I shall discuss in detail in this section. I will quote and reference the participants regularly in the discussion of the findings, so here is a chart of who each participant is and the parts of the study in which they participated:

Table 1: Research Participants

Participant	Subject	Observation	Interview	Questionnaire
Jim	Global 9	X	X	X
Josh	Global 9	X		X
Greg	IB HOTA	X		
Amanda	Global 9		X	
Melissa	IB HOTA		X	
Craig	8:1:1 US History	X		X

Finding One: On Both a District and Teacher Level, Preparation is Key to the Successful Implementation of a 1:1 Chromebook Initiative

Slow network speed and a lack of adequate professional development consistently presented themselves in my data as a barrier to Chromebook instruction. In all three interviews,

the participant mentioned issues with the wireless network or internet speeds. I also observed network issues in two of my observations. In addition, teachers cited not feeling adequately trained to use the Chromebooks at the beginning of the school year. All this points to the importance of a school district ensuring that it is indeed ready to handle the implementation of a 1:1 Chromebook initiative.

Lack of infrastructure as a barrier. Several data sources (three interviews and two observations) supported that lacking wireless technology, or more specifically inefficiencies of that technology, served as a significant barrier to instruction. Simply put, the wireless networks could not handle the load of classrooms going paperless with the Chromebooks. Although the issue improved from the beginning of the year, it continued to persist until the midway point of the school year when I collected the data.

Genesee District had wireless routers throughout the building, and in many classrooms. However, they were not in every classroom. Two or more teachers would have to hook onto one router. The problem with that lies in that each router could only handle up to 30 Chromebooks at once. Therefore, two classrooms could not simultaneously connect to the same router. This would result in students losing their internet connection, and needing to authenticate again. The students should only have to authenticate (log in to the network) once when they arrive at school for the day. However, because the routers could not handle the traffic, the network booted the student off, and their work was online. Thankfully, work on Google Classroom automatically saves, so they were not losing work. Despite this, Jim said it still wasted students' time when they needed to spend a minute and a half logging back on to the network, instead of working. It also served as a frustration point for students. According to Jim, "I had kids reauthenticating seven times in a 55 minute period."

The lack of network reliability consistently presented itself in the data. Jim cited the network dropping students several times, and had many conversations with the district personnel in charge of the network expressing that it was a major issue. Although the network improved slowly throughout the year, it still was not where it needed to be. According to Jim, “the network needs to be able to handle 1,200, and next year 1,500 Chromebooks, all at once. Every single teacher using them.” Jim said he does not know how realistic that is, but to realize the goal of a 100% paperless school, that is what needs to happen.

Amanda cited the network pickup as a “major issue” as well. She mentioned that the speed tended to slow down when experiencing heavy traffic, serving as an additional frustration point for students. Melissa also cited that the network sometimes dropped kids while they worked during her interview. When observing Josh, I noted two separate students had issues with the network. The network booted off one student and she had to log back on. The other student could not log on at all, and was unable to do any of the work. This occurred in February, six months into the school year. During Craig’s observation, Craig lost his connection to the network while giving notes. He was able to keep giving the notes as the page had loaded, but it could have been a much bigger issue had his notes not loaded. These interruptions in service could also slow down learning, and give students less time to practice disciplinary literacy skills.

Most existing research into 1:1 programs, with iPads or laptops, do not refer to network capabilities in any manner, positive or negative (see Downes & Bishop, 2015; Zheng et al., 2014). Therefore, this is an area of concern that a school district can easily overlook while preparing to implement a 1:1 initiative. There is literature to support that students have a negative opinion of 1:1 technology however. According to Zheng et al. (2014), “only 47% of high school students (surveyed) agreed” that their school district was “doing a good job using

technology to enhance learning and/or student achievement” (p. 281). Although Zheng et al. (2014) did not reference network performance in their study, network performance served as a frustration point for students according to the participants of my study. Any frustration points could drive down student opinions of the technology in general.

Teachers were not ready to Fully Utilize Chromebooks. Genesee School District used iPads as the device of choice for their 1:1 initiative from 2013-14 to 2015-2016. In 2016-17, the district decided to change from iPads to Chromebooks. However, the participants of this study did not receive adequate professional development on how the Chromebooks could benefit their classes. The Chromebook also varied in function from the iPad.

According to Jim and Amanda, the district offered a professional development course in the summer of 2016. However, the course did not focus on the Chromebooks, but focused on the program, Microsoft OneNote. Jim shared that the intention of the district was for OneNote to replace Notability. Notability was the program that teachers at Genesee used for assignments on the iPad. It allowed students to write, edit, and annotate on documents. However, Notability does not function on the Chromebook. Therefore, teachers did not know which program could replace it. The district thought that OneNote could be that program.

However, OneNote would not be a replacement for Notability. According to Amanda, “That was a major headache. That you did all that work (at the training), and ‘what do you mean we can’t do that?’ ... That was a big disappointment.” Amanda came into the training hopeful that OneNote would provide exactly what she needed, and saw potential in it. However, the program disappointed her when she realized that it would not work and properly interface with the Chromebook. Students could not annotate documents, among other problems. Jim explained, “I took the course, I did not like OneNote. I was not going to use it. So September 1st

came about and I turned my Chromebook on for the first time, and I had to decide, how the heck am I passing out my work seven days from now?”

Jim was not the only one to find themselves using a device to teach with which they had little experience. Melissa reported that she did not even receive her Chromebook until after school started. Amanda did not teach for eleven years to raise her children. She came back into the profession feeling way behind on technology in general, and had to teach herself most of the technology. The beginning of the year was a struggle for the participants. This struggle hindered their teaching. The TPACK framework of Mishra and Koehler (2006) requires a balance on technology, pedagogy, and content. If the teacher lacks the technological knowledge, as my participants did, the pedagogy and content suffer as well.

The teachers settled on Google Classroom and other Google applications as the primary programs to use with the Chromebooks, but the beginning of the year still proved difficult. “It took me two weeks of running fast... we weren’t prepped and we weren’t ready to go,” Jim recalled. The teachers attempting to have a mostly paperless classroom had to learn as they taught and figure things out, as they were unfamiliar with the Chromebook and what worked well with it. This finding reflects what Hutchison and Woodward (2014) found in their study, where limited technical knowledge of the iPad limited a young teacher’s initial use of the device. However, in Hutchison and Woodward’s (2014) study as well as my study, following the acclimatization period to the technology, the devices provided unique opportunities to enhance classroom instruction.

Finding Two: The Chromebook Can Create a Seamless Educational Experience

Despite the barriers that exist with implementing the Chromebook as a 1:1 device, it provided the opportunity to create a seamless educational experience for students and teachers.

This seamless experience stems from the advantages of going paperless with both the organizational benefits that Google Classroom offers, as well as cutting down on transitional time when the teacher does not need to pause to hand out papers. The seamless experience led to more time in the lesson for disciplinary literacy based assignments.

Google Classroom, Google Drive, and the Digital Binder. I started my interview with the question “In what ways do you utilize the Chromebook in your classroom?” (see appendix B for full template). Jim responded:

We try to fully integrate (the Chromebook) where their daily lesson is inputted into Google Classroom. They keep their binders in their Google Drive. We create a folder for each category that they keep warmups and notes in, along with vocab and such. So the old style binder is replaced with a Google binder because all handouts and notes are distributed to them digitally, and we’ve gone to the assessments being pretty much done online as well.

This was Jim’s response to my first question in our interview. The response very heavily favored Google Classroom. It was easier for the students to receive and interact with notes as well. There was no need to take notes off the overhead for 20 minutes anymore. Jim mentioned in his interview, and I observed as well, kids getting concrete notes, with some fill in the blanks and doing some highlighting as well. This also allowed the students to have color for their maps and charts, as common core standards push for more document interaction (Monte-Sano et al., 2014). “You can’t give four pages of notes (the old way) and accomplish anything else in a day. Now, you can give four pages of notes, they can have maps, they can have color. You just have the kids fill in a couple of blanks and highlight, and now you have discussion time available.”

Melissa used Google Classroom and its features heavily too. In her interview, she listed off the various applications that Google has available in Google Classroom and Google Drive, such as Docs, Slide, and Forms. Melissa used some other programs as well, such as DocHub, but the consistency of the Google programs was most convenient to her. Amanda also put her assignments on Google Classroom, and had the students highlight and annotate various reading assignments.

I observed the use of Google Classroom in all four observations. Josh had students turn in an assignment as a Google Doc, and then later directed the students to Google Classroom for the notes and materials for the day. The kids took their notes on the Chromebook, and they were able to have class discussion from it. In Greg's IB HOTA lesson that I observed, the students worked on a research project called the Internal Assessment. It was a major research assignment. Students not only needed to find sources, but they needed to evaluate their credibility as well, a historian level skill. The entire project was on Google Classroom, and the students completed the entire assignment on their Chromebooks. The students still had several weeks left to complete it when I observed, but the lesson was an early workday. Having the project on their Chromebooks with Google Classroom and Google Drive allowed for the students to easily work on it anywhere with nothing more than their Chromebook. To see the assignment in detail, please reference Appendix C.

While I observed Craig, he also used Google Classroom extensively throughout his lesson. He posted all of the materials there, and the students did not need much direction, the routine was familiar to them so the class started quickly. Student familiarity with the routine presented itself in all four observed lessons. Craig's lesson began with students clicking a link to watching a video, and filling out a digital worksheet that went with the video. They then quickly

switched to notes for the students to take. Craig also had students take small quick quizzes about the notes and videos on Google forms. After the lesson, Craig revealed to me that the purpose of these quizzes were formative. Google forms provided him with many data as to what questions the students consistently miss, and what ones they got right. He very quickly could tell what parts of the lesson he needed to readdress thanks to the quick feedback from Google forms. In addition, Craig would quickly import results on assignments he wished to grade into his gradebook, thus he saved time grading as well. The idea of students quickly getting to work, transitioning quickly, and the teacher saving and maximizing time lends to the next part of this finding.

Paperless classrooms create seamless lessons. These seamless lessons maximize class time, as well as teacher prep time. A major advantage of having all notes and assignments online is that the teacher does not have to take the time to hand out papers. According to Jim, that should be the goal, “there is no point in using (the Chromebook) if it’s not seamless”. The Chromebook enabled that seamless classroom where teachers could get through a lot more in a period, and kids worked at their pace. Jim explained his seamless classroom as follows:

What I want to accomplish in a 55-minute period is a lot. But again, I think the Chromebook allows that to happen, with the quick accessibility, the smooth transitions, and the ability of some students to move ahead. Otherwise, you are passing out papers, and if they’re done, then you have to come get the next paper. Where (with the Chromebook) other kids don’t know where other kids are, so there is no pressure of not being where you are supposed to be. Where one student is actually doing the homework because they got ahead, and they can get away with that. Whereas another student is just finished with the classwork assignments, and that is okay too.

I observed the quick transitions in Jim, Josh, and Craig's lessons. In my notes for all three participants, I mentioned "quick transition" or used the word seamless at least once in each. I did not record the same in my observation of Greg, but his lesson was different because it was a research project workday so there were not many transitions. Each teacher had established their routine, and could quickly move from task to task with minimal transition time. This enabled each teacher to complete their lesson plans quicker, and thus plan to do more with a typical lesson. Students completed disciplinary literacy based assignments without sacrificing notes and content.

The Chromebook better prepared students for interruptions as well. While I observed Jim, counselors came in and periodically pulled students for about 5 minutes at a time for course selection purposes. This could really derail a traditional lesson. However, because all the material was online and accessible to the students, the students just came back in and worked on catching up without having to interrupt Jim's teaching. Jim did not have to fill the students in on what they missed in those five minutes because it was right in front of them. A similar situation occurred in Craig's class. The students were individually watching the video and taking notes. This allowed Craig to move amongst the students and answer questions without compromising the other students work time. A student on Craig's special education caseload was in the classroom despite not being in the class, and was working on her application for college. Craig was able to assist her with that as well, without losing any instructional time. That would not have been possible without the Chromebook.

The paperless environment also made lesson preparation quicker in some ways. I already mentioned how Craig has his system set up for faster grading. Amanda discussed in her interview how the Chromebook made her prep easier:

It's easier for me to cut and paste and put different lessons together based on different documents. That's opposed to me having to manually cut and paste things and throw them together on a copier. It's easier for me to put something together electronically. As opposed to the old school, having to copy it off hard copy. And just the fact that papers don't get lost.

Therefore, the paperless classroom created the potential to get through more material in class, while still cutting down on prep time.

Finding Three: The Chromebook can Function as a Tool for Fostering Independence and better prepare Students for College.

The Chromebook did more than allow teachers to pack more into a lesson. It pushed kids to become more independent with their work, and better prepared students for the rigors of college. As Jim put it, "(we are) creating that independent, responsible kid, because that's what college is".

The Chromebook as a tool for fostering student independence. The students became responsible for their work and could work independently, even if they miss class. As Jim said in his interview:

When they're not in class for whatever reason, they're sick, lesson, left early for a sporting event, whatever it is, the old question of what did I miss disappears. They know what they missed. Every lesson is posted daily; they need to learn the responsibility of checking. I keep telling them there are kids who are home sick and they are turning in their work before kids in the class are turning in their classwork... the kids ask 'man why are they doing that from home?', and I say 'because it is responsible.' You know, it's

accessible, now they are coming in and they don't have to make up global work, they only have to make some other class' work.

Craig mentioned the same benefit to online assignments in our follow up conversation after his interview. Kids could make up the work if they were absent, and they did not have to fall behind. Craig also discussed how much easier it was for kids to find missing assignments and make them up if they are behind. He numbered all his assignments and everything was on Google Classroom, so the kids could easily go and find and make up their work. Each assignment even showed next to it if it was turned in or not on Google Classroom. The benefit was that students could independently go through all of these assignments. They did not need to rely on their teacher or anyone else in order to complete these assignments, they could do it all on their own.

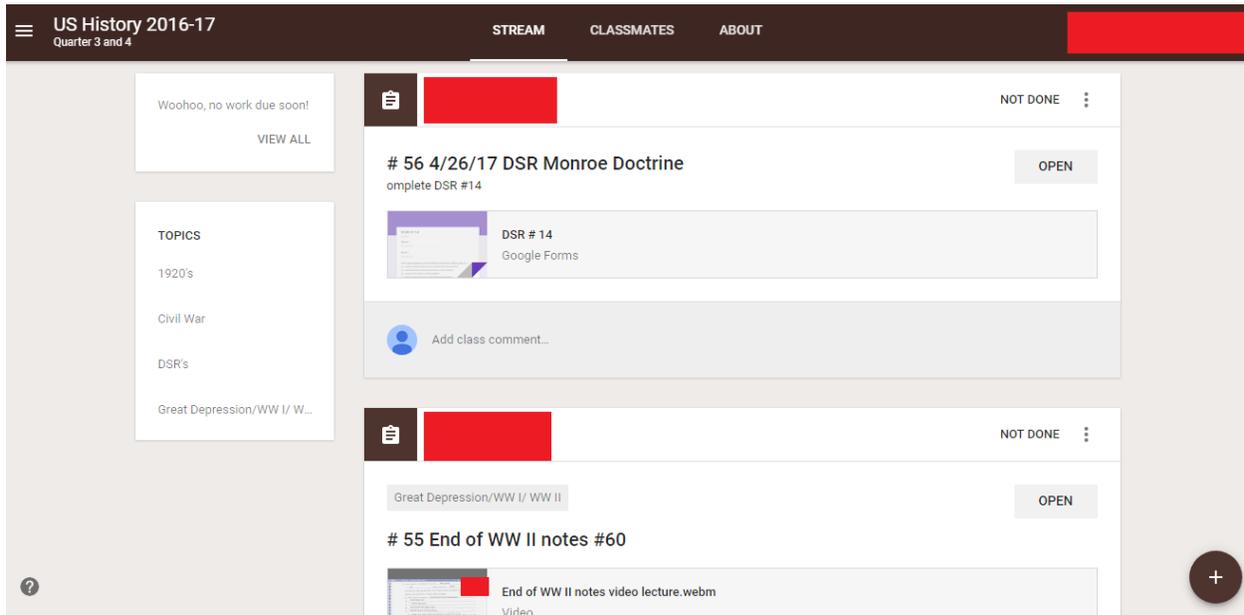


Figure 2: This screenshot shows what Google Classroom looks like to each student. There is a spot to the left to jump to each topic. The upper right corner of each assignment is marked as not done, done, or returned. This helps the student keep track of which assignments they completed. The links can go to anything from homework, quizzes, notes, or lecture videos.

Before the Chromebook, after missing a class the students had to get papers from the teacher the next day, try to find copies of notes, and then have double the work to do in order to catch up. The Chromebook let the student complete the work independently to avoid falling behind, and they could do it entirely independently. According to Melissa in her interview, the students could also email the teacher when they miss work, and that extra level of correspondence helped students with questions or that were falling behind. Melissa also cited students doing more work at home on their own time. She specifically mentioned that the Chromebook fostered responsibility and accountability. That independence and responsibility mirrors the traits necessary for collegiate success. Responsible students are students that are more efficient; therefore, this helps students with their historical thinking skills as well.

The Blackboard Movement. The fact that colleges are pushing for more technology integration is no secret. Many campuses use programs such as Blackboard for the submission of work and distribution of material. Jim pointed this out in his interview. “I constantly go back to movements in college, with Blackboard. It doesn’t mean you are taking more online courses, but professors are pushing more out via Blackboard, they are collecting more via Blackboard, which is like Google Classroom because they don’t have to print.” Jim goes on to state, “if we are not prepping these kids, imagine the transition from high school to college if suddenly, they are like whoa, technology integration, I wasn’t ready for this. So the earlier we can start it the better.”

One could also view Greg’s research project (appendix C) as college preparation. The students completed all of the work online, and submitted it online, as they would with a research project in college. That research also helped the students develop skills that they need to succeed in college classes by having them find and check sources while gathering information. All of this online work on Google Classroom and with other Google applications simulated the

collegiate environment that utilizes Blackboard or similar programs. The participants in all three interviews mentioned Google Classroom, and every observed participant integrated Google Classroom into their lesson.

Finding Four: Teachers who have Committed to it have a Generally Positive Opinion of the Chromebook as a Piece of Technology and a Tool for Enhancing Disciplinary Literacy.

Overall, teacher reaction to the Chromebook was positive. Though the Chromebook may have a few flaws, they liked its potential as a piece of technology and a tool for enhancing disciplinary literacy. However, this opinion varied. Some teachers displayed far more confidence in the Chromebook and its capabilities than other teachers did. This variance presents in how they discuss the technology, and one can see quickly if that teacher has ‘bought in’ to the Chromebook concept. If a teacher bought into the Chromebook, they can utilize that technology component to enhance their content and pedagogy as well (Mishra & Koehler, 2006).

Teachers that bought into the Chromebook. Jim said this during his interview “I was committed to making it work... and I truly believe the kids have bought into it.” This response exemplifies how he managed to create a seamless classroom. Jim displayed confidence in the Chromebook and his own ability to use the Chromebook. Even when facing network issues and other issues that occurred at the beginning of the school year when implementing the Chromebook initiative, Jim felt assured of his abilities and remarked that “even after those first couple of weeks, I knew I was going to be able to make it work.”

Jim had a very positive outlook on the technology, and displayed confidence in his ability to use it. Craig also displayed a very positive outlook on the technology. In the conversations I had with Craig both before and after his observation, he displayed sureness and a positive outlook on the capabilities of the Chromebook. Craig even showed excitement, not only for how

he used the Chromebook in his class, but at all the ways he had not yet used it. He looked forward to expanding the Chromebook and finding new ways to use it in his class. When observed, both Jim and Craig had successful lessons that impressed me with the amount of material covered and tasks accomplished with seamless transitions and their efficient pace.

Both Jim and Craig responded very positively about the Chromebook on the questionnaire as well, with most answers scoring high, and all answers at least receiving a neutral answer, with Craig giving many 5 responses. Josh also completed the questionnaire, and he scored favorably as well, despite admitting in the comments that he mostly uses it for organizational purposes. Josh recognized that the Chromebook could improve disciplinary literacy and be effective, but he personally was still experimenting with its benefits. Regardless, he put a 4 out of 5 for that item and agreed that he found the Chromebook to be useful and looked forward to continuing to use it. Although the sample size is small, three veteran teachers (the mean years of experience amongst the three is 19 years) that use the Chromebook daily scored the Chromebook favorably. The score ranking went from 1 – strongly disagree, to 5 – strongly agree. Though this study is qualitative in nature, looking at the numbered results from the questionnaire helps to paint a better understanding of the teachers' opinion of the Chromebook and answer research question #2. See Appendix A for the original questionnaire.

Here are the mean results from the questionnaire for the three teachers:

Figure 3: Questionnaire Mean Results

Question	Mean Score
I use the Chromebook every day in my instruction.	5.0
I believe that the Chromebook is a highly efficient piece of technology.	4.0
The Chromebook offers a unique opportunity to teach that I otherwise would not be able to employ.	4.0
The Chromebook enhances my instruction.	4.0
I can tailor use of the Chromebook to fit into my lessons easily.	4.3
The Chromebook is an effective tool for enhancing social studies content.	4.0

With the Chromebook, I can more effectively deliver content and instruction to my students.	4.7
I can teach social studies content more effectively with the Chromebook than I could without.	3.7
I have a strong understanding of the Concept of disciplinary literacy.	3.3
Disciplinary literacy is an important part of a high school social studies classroom.	4.3
I incorporate best practice in regards to disciplinary literacy in my classroom.	3.7
The Chromebook influences disciplinary literacy in my classroom.	3.3
The Chromebook has a positive influence on disciplinary literacy in my classroom.	3.7
The students are familiar with the technology, and can use it effectively.	4.3
I find that the students are constantly distracted by their Chromebooks, and it negatively impacts instruction.	2.3
My students feel that the Chromebook helps them learn.	3.3
Overall, I find the Chromebooks useful, and hope to continue to use it in my classroom.	4.3

Overall, the responses were positive. The scores were slightly lower for questions regarding the relation of the Chromebook and disciplinary literacy, but those numbers could be higher if the teachers had a higher understanding of the concept of disciplinary literacy. Apart from the questionnaire, Melissa also had a positive opinion of the Chromebook. She spoke positively about it in her interview, but she did not complete a questionnaire.

Teachers with reservations about going paperless. Not all teachers agree with using the Chromebook every day in their classes. I invited many teachers to this study that chose not to participate. Some of these teachers did not participate because they chose not to use the Chromebooks in their daily lesson plans. Jim pointed to the lack of professional development opportunities with the Chromebook as a contributing factor for that, “we weren’t prepped and we weren’t ready to go. So if a teacher wasn’t as open-minded as I was or had started it last year (when the district used iPads instead of Chromebooks) and was like I’m not taking a step

backwards. A lot of teachers just, I don't want to say gave up, but said no, I'm not using the Chromebook, because we really weren't ready."

The participants of this study did not all respond entirely favorably. Amanda revealed that she had mixed feelings in her interview. Her mixed feelings stemmed from two misgivings about the Chromebook. The first misgiving was her lack of confidence in her own technical skills to utilize the Chromebook. Amanda is a veteran teacher and a successful one, but she is not confident with the technology. She left the profession for eleven years to raise her children, causing her to fall behind on the progression of technology. When she returned, she did not get to adjust yearly to the changes like her colleagues, but found herself eleven years behind. She even admits that the students may know more than she may, "kids who might know more about the program than maybe I do will claim they have a problem when they are really just trying to ditch work. I know that was happening at the beginning of the year while I was becoming more familiar with it."

Her second misgiving was that she did not fully support going completely paperless, as she did not believe it was beneficial to all students. She elaborated, "I think some students, with their learning styles, need to have a hard copy. It's how they read information." Despite these two misgivings, Amanda still pushed through and uses the Chromebook daily in her lessons. She was willing to try new things and took risks to benefit her students, which is commendable.

If the teacher buys in, the students buy in. Jim reported success in getting students to buy into the Chromebook initiative, but not without a fight. In the beginning of the year, the students were resistive to change. His group of freshmen had iPads for years and had to make the change to Chromebooks. Some kids never liked the iPads, and did not want Chromebooks either. Other kids did not want to get rid of their iPad. The kids complained about the

Chromebooks frequently; complaints that the network issues that plagued the start of the school year did little to abate.

Despite the initial resistance, Jim got the kids to change their opinions on the Chromebook. Jim says, “I believe if you stick to it and you create a good system, they buy into it. You just, you have to teach them why. Why is it good, why is it being used? You don’t just do it; they have to see what they are gaining from it.” Through consistency and creating a good system, Jim managed to accomplish that. Halfway through the school year, Jim offered to go back to paper assignments for a unit, and the students said no, “please don’t do that to us”. He told the students, “once you went half the year paperless and getting used to the technology, you don’t want to go back to losing papers and stuffing your backpacks”, and the students admitted it. “They’re like, one good thing about this class is ‘we don’t have to organize by hand all that stuff.’ It’s all digital.”

Other teachers had misgivings about the students and their acceptance of the technology, but Jim managed to create a system where the kids buy in, thanks to his knowledge and confidence in the Chromebooks. As Jim said, “(the students) wouldn’t want to go back to an old system. You have to truly sell it as successful. Teach them how to use it, but also why it’s being used, constantly.”

Finding Five: The Chromebook can function as a Tool for Enhancing Disciplinary Literacy in Social Studies.

The first four findings illustrate the overall effectiveness of and opinions towards Chromebooks. The data showed that the Chromebook is a good piece of technology, and teachers who used the Chromebook had generally positive opinions towards it. Understanding this, we can now analyze if the Chromebook also enhances disciplinary literacy instruction. The

data showed that the Chromebook can function as a tool for enhancing disciplinary literacy, by improving students' abilities to research, fact check, work with historical knowledge, and other history-based disciplinary literacy skills (see Monte-Sano et al., 2014; Waring & Robinson, 2010).

The Chromebook aides in research. Research is an important component of disciplinary literacy in social studies. Historians constantly engage in research and ask questions about the past, so it is something our students should do as well. Greg's students worked on this during the lesson I observed. The Chromebook helped the students with this, as all of their information and sources were in one electronic place, and they could work on it anywhere. In the case of a major research assignment like the one Greg's students worked on, the portability of the Chromebook combined with its functionality aided the students and proved to be quite convenient.

The other aspect of research is checking the validity of sources, something very important to a historian. The Chromebook helped students perform these checks. Part of Greg's IA assignment is for students to evaluate their sources. The students had to complete an OPCVL chart for a certain number of their sources. OPCVL stands for origin, purpose, content, values, and limitations. Melissa used these OPCVL charts in her classes as well, according to her interview. This analytical approach is a disciplinary literacy skill. The Chromebook offered the student access to a wider variety of sources to evaluate, while Greg provided helpful links that the students could easily access. The students utilized their Chromebooks to evaluate and consume content, which supports effective learning (Pacino & Nofhle, 2011; Waring & Robinson, 2010).

Jim also recalled students checking sources during his interview. He told a story where a kid asked a frivolous question, “Who is the most partying Pope?” Jim could have easily shut this down as a kid being silly, but they were talking about Popes at the time. Instead, he had the kid try to look it up, and he thought he found an answer on Wikipedia. Another student chimed in that you cannot use Wikipedia, it is not scholarly. So Jim replied that you can use Wikipedia as a starting point, but what do you have to do? Check your information and try to collaborate the data with another source. So another kid looked up that Pope, and it turned out that pope tended to throw more celebrations for big events than other popes did, thus how the other student misconstrued that as a ‘partying pope’. A quick joke made by a student became a teachable moment and a practice in disciplinary literacy skills, and that would not have been possible without the accessibility of the Chromebook. The students began to think as a historian might, and thinking as a historian helps students to read and write like historians (Wolsey & Faust, 2013).

The Chromebook allows for instant fact checking. The Chromebook offered an accessibility to information far beyond what a student could access in a traditional classroom. Jim pointed out in his interview, “I love what I call the fact-checking aspect that has occurred in classes where, as (the students) are asking questions I can’t answer, and within a minute usually a student has found the answer. Which gives us a discussion point in class.”

Not only did Jim discuss this in his interview, I observed it in his lesson. Jim taught trade routes in that lesson, and they discussed the bubonic plague coming from Asia to Europe via rats. A student asked Jim how many types of plagues there were, and Jim could not remember off hand. A student quickly raised his hand and provided the answer after googling it (for the record, there are three types of plague: bubonic, septicemic, and pneumonic).

A similar thing happened in Josh's lesson. Josh asked the students a question from last night's homework, and no one could provide an answer. Instead of just telling them, Josh had the students look the answer up. The accessibility of information at the students' fingertips allowed Josh to hold the students accountable for the answer to his question.

Kids becoming thinkers. The participants frequently mentioned disciplinary literacy applications across the interviews I conducted. I also observed plenty of other disciplinary literacy skills apart from the specific research and fact checking mentioned earlier, practices designed to get the kids to become thinkers.

Jim mentioned in his interview how kids always ask him that annoying question, "Why do we have to take this class?" Jim responds, "It's not the content, why you take social studies. It's the skills and it's the research based aspect." He gave an example where they were discussing English law, and got the kids to realize that many social studies people become lawyers. Because "that's research and accessibility of information, and how to research properly. The Chromebook puts more of that research or information accessibility into the fingertips and then picking and choosing what's good information and what's not good information. That's versus without it you have the limited textbook and printed documents that you would give the kids."

Jim later cited trying to get kids to become more analytical. He explained that his goal for kids is for them to:

To show their understanding, to give their explanations of the facts of history through their understandings and interpretations and comparisons. That it's not just memorizing the facts. Because that's why (some students) say they don't like social studies, (they complain) 'it's about memorizing names and dates'. I constantly say 'give me a date that

I've asked you to memorize this year'. Because I don't I want (the students) to be able to understand, to connect event A to event C, and tell me why B helped bridge it. I mean that's, getting these kids to become thinkers.

For Jim, the Chromebook gave him more time to accomplish that goal, of turning kids into thinkers. He provided more tasks to students and moved through them quicker in order to get through more in a 55-minute period. He could offer more maps, charts, and pictures to the students and do so in color. Jim credited the Chromebook for helping his kids become thinkers. I observed this in Jim's lesson as well. The kids answered questions, pulled information from readings and charts, and analyzed documents. The kids could quickly jump from document to document or task to task thanks to having the Chromebook in front of them.

Melissa also mentioned several 'thinking kid' practices in her interview. Melissa said that disciplinary literacy in her classroom is students interpreting a document and understanding its significance. She taught Advanced Placement courses as well, and got even more in depth for those. She believed in providing a variety of assignments to her students. They needed to be able to read and annotate documents, complete charts, and use OPCVL (origin, purpose, content, values, and limitations) charts to evaluate sources.

The Chromebook helped Melissa provide a wider variety of documents to the students, and made assessing their writing easier for her. She also credited the Chromebook for helping students to complete peer editing more easily than before. She liked the students to look at what analysis is, and realize that there are different answers to one question. The Chromebook is a useful, flexible tool for achieving that goal.

Amanda's students used the Chromebooks daily, and she asked them to read for information on the Chromebook, and annotate and highlight as they do so. "When (students)

look at documents, make sure that they look at it with a critical eye, like a historian would.”

Amanda focused heavily on documents in her class, both primary and secondary. The Chromebook gave her access to more documents to find and provide to her students.

Josh and Jim both did current events with their students. Jim mentioned them in his interview, where he has kids look up events on their Chromebook and analyze them. Josh had students share a couple of their current events aloud during the lesson I observed. In both cases, the students analyzed current events through a critical historical eye, thinking about the situations going on in the world around them.

In Craig’s lesson, he used the Chromebook’s features to provide students with instant feedback. They submitted the answers to worksheets and quizzes electronically, and most of the assignments (any non-writing ones) provided instant feedback for the students to go over their answers. To Craig, the benefit of the Chromebook was that it made it easier for the students to self-monitor and check their answers. They did not need to wait for the teacher to give them feedback to start checking their work to learn and grow. Metacognition is an important aspect of becoming a deep thinker.

Discussion

Summary of Findings

I conducted this study to answer the following questions: Do Chromebooks affect disciplinary literacy in high school social studies classrooms, and if so, how; and what is the professional opinion of teachers on the Chromebook as a tool for enhancing disciplinary literacy?

While exploring these studies, the data revealed five major findings: A.) on both a district and teacher level, preparation is key to the successful implementation of a 1:1 Chromebook

initiative, B.) the Chromebook can offer a seamless educational experience, C.) the Chromebook can function as a tool for fostering student independence and better prepare students for college, D.) teachers who have committed to it have a generally positive opinion of the Chromebook as a piece of technology and a tool for enhancing disciplinary literacy and E.) the Chromebook can function as a tool for enhancing disciplinary literacy in social studies. There are several conclusions stemming from this data.

Conclusions

Conclusion one: the biggest barrier to Chromebook implementation is people. The constraints of the Chromebook mentioned in the findings stemmed from human factors. From a lack of preparation to a lack of faith in the technology, these issues were avoidable, including the issues with internet pickup. Genesee School District could have avoided this by ensuring that their network could handle the load of students who needed to access the routers simultaneously. However, the school's network could not handle the load, and they still had wireless network problems halfway through the school year. It is not realistic to expect the network to be 100% error free, but one could say that of any instructional method. District personnel can minimize the amount of network/interface issues simply by improving their wireless infrastructure. The connectivity issues are not a fault of the Chromebook itself.

Jim and Amanda both mentioned the students resisting change in their interviews. If the teachers do not commit to the technology and have misgivings, students will not buy in. Amanda mentioned in her interview how she thought, "some kids need that hard copy." Amanda clearly had misgivings about the Chromebook and going paperless, and admittedly was not as confident. As a result, she also shared that her students were not as committed to the

Chromebook, whereas Jim believed his students had bought into it. If the teacher prepares properly for the Chromebook and commits to it, the experience will go much more smoothly.

Conclusion two: the Chromebook is highly efficient with Google features. Findings two and three (creating a seamless classroom and fostering independence while preparing kids for college) are possible primarily due to the Chromebook's superb integration of Google features. Teachers used the Chromebook to move from task to task quicker, with no down time to pass out papers, which allowed for more student work time and discussion time. Teachers packed more into a lesson this way, thus allowing more time for the infusion of disciplinary literacy practices.

To accomplish this task, teachers took advantage of how well the Google features, such as classroom, drive, docs, slides, forms, amongst others, interface with the Chromebook. Now, Google features are accessible from most devices. One would have a hard time finding a modern device that could not access Google Drive at the very least. However, the Chromebook integrates the Google features extremely well; the manufacturers designed it to do so. In addition, the fact that the Google features are accessible from any device means kids can easily access their work from home or from an alternative device (even their mobile phone) should their Chromebook be unavailable for any reason. This universal access helps students become more independent with their learning.

I familiarized myself with a Chromebook before conducting my research. There were shortcut apps on the main desktop screen, and the interface was easy to use. The Chromebook also allowed the user to split the screen, and have two windows open at once. This meant that a student could have a reading on the left side of their screen, and extension questions on the right. Using Google features on a Chromebook was a seamless experience for the user. Sometimes,

people even referred to the Chromebook as a Google Chromebook. This researcher actually believed Google Chromebook to be the name of the model of Chromebook used at Genesee until he confirmed the correct model with district personnel.

Conclusion three: teachers approve of the Chromebook. As mentioned in finding four, this comes with a caveat. Teachers approved of the Chromebook, if they agreed to commit to using the device in their classroom and bought in to the technology. Many teachers at Genesee chose not to participate in this study because they elected not to use the Chromebooks in their classroom. The teachers that gave it a chance liked what the Chromebook offered them. A great example of this is special education social studies teacher, Craig. Craig revealed to me in our post-observation debriefing that he was against the switch to Chromebooks, but after getting to familiarize himself with the Chromebook, he fell in love with it. He consistently gave the Chromebook the highest scores on the questionnaire, to confirm his preference for the Chromebook.

This case study explored how one piece of digital technology could affect classrooms in a particular way. For this study, that piece was a Chromebook. Not many studies focus on the Chromebook, but there are studies that focus on laptops, which are similar to Chromebooks (e.g. Downes & Bishop, 2015; Tallvid et al., 2015; Zheng et al., 2014). Other studies examine other mobile devices in the classroom, such as iPads (e.g. Barton & Trimble-Roles, 2016; Hutchison et al., 2012; Simpson et al., 2013).

Conclusion four: the Chromebook can enhance disciplinary literacy in the high school social studies classroom. Shanahan and Shanahan (2008) discuss and define disciplinary literacy. They would add to and expand upon this definition and discussion with later works as well (2012; 2014). My study used their definition when considering what to look for during data

collection. Learner (2015) also provided an additional definition. There are several studies and articles that discuss practical applications of disciplinary literacy as well (e.g. Gilles et al., 2013; Gillis, 2014; Waring & Robinson, 2010). Other studies worked more similarly to this one, and looked at disciplinary literacy, social studies, and/or technology (e.g. Dobbs et al., 2016; Reisman, 2012; Wickens et al., 2015; Wineburg & Reisman, 2015).

My study also incorporated Mishra and Koehler (2006) TPACK framework, which other studies before have done (e.g. Hutchison et al., 2012; Hutchison & Woodward, 2014). This study is also one of many studies that focused on digital literacy (e.g. Kervin et al., 2013; Neumann, 2016; Pacino & Nofle, 2011; Park & Burford, 2013).

The Chromebook, when properly implemented, can enhance disciplinary literacy instruction in a high school social studies classroom. Researching and fact checking are important skills for a historian. The Chromebook made it easier for students to practice those skills by placing a wealth of knowledge at their fingertips. Students could access more documents and information than they could by conventional means. It was also easier for teachers to find and supply more documents and sources.

Students also got more time to put their historical skills to practice with the Chromebook. Teachers could deliver notes much faster than they could conventionally. Four pages of notes used to take most of a class, causing the kids hand to cramp up. With the Chromebook, the teacher could give out the same amount of notes quicker. This allowed students time to complete more discipline specific tasks. In short, the Chromebook helped teachers design lessons that allot more time for practical application of historical skills without sacrificing content.

Implications

For teachers. This study contained implications for teachers. Teachers should contemplate two major considerations if they have the opportunity to go paperless with Chromebooks via a 1:1 initiative. First, they should check with the appropriate district personnel to ensure that the district has the infrastructure in place to meet your classroom needs. Network barriers will result in a delay in getting your students to believe in the Chromebook as a beneficial educational tool. Teachers should direct these concerns to district personnel so that they are prepared.

The second implication for teachers is self-confidence and device-confidence. If teachers plan to use Chromebooks for their daily lessons in their classrooms, they need to believe in the technology as well as in their own abilities to make it work. Because it can and it will work, but teachers need to commit to the idea. If teachers resent the Chromebook, so will their students, destroying the potential of the Chromebook. If teachers want the benefits that the Chromebook can offer, they must be 100% committed.

Implications for students. A 1:1 classroom with Chromebooks obviously greatly affects students, and they are highly invested in their success or failure. Students can influence that success or failure with their own attitudes toward the Chromebooks. Generally, students are resistive to change, not unlike many teachers. Kids can be stubborn, so how do teachers get the students to buy-in into the technology?

As Jim stated during his interview, “you have to truly sell (the Chromebook) as is, and as successful. Teach them how to use it, but also why it’s being used, constantly.” Students need to invest their learning in these devices, and they need to know why. They need someone to explain that to them. If the teacher does that, and accepts nothing other than a successful system,

the kids will respond. Jim said about his students, “I truly believe that the kids have bought into it. They wouldn’t want to go back to an old system.” Because Jim implemented the Chromebooks and sold the system to the kids, they preferred the Chromebooks to traditional teaching methods.

Implication for school districts. As I eluded to throughout my findings and in my implications for teachers sections, school districts need to prepare. After district decision makers go forward with a plan to implement Chromebooks as their 1:1 device, they need to make sure they are ready for it. The research aspect for districts goes beyond determining that the Chromebook, or any piece of digital technology, will benefit their students. Districts need to make sure that they explore their resources to make sure their infrastructure can handle the jump to multiple or all teachers going paperless. What are the current capabilities of each buildings’ wireless network? How many teachers will be utilizing the network at once? Can the network handle that number? What improvements does the infrastructure still require? These questions are easy to overlook, as most decision makers focus on the lessons associated with Chromebooks, but districts must remember to consider the big picture.

Implication for my practice. I entered into this study with preconceived notions that I needed to set aside. As an employee at Genesee High School, but not one with my own classroom (see positionality statement), I had thoughts about the Chromebook before beginning the study, on top of the teachers who served as research participants. I set them aside to conduct the research, but feel that I should note that I was one of those teachers with mixed feelings about the Chromebooks; a feeling shared by many of my colleagues. I saw potential there, but did not know how to use it in a way that would be beneficial to the students. After completing this study, and noting all the ways my participants use the Chromebooks to improve their

lessons, I can now say that I am eager to move forward in my career, and incorporate technology into my classes. Completing this study convinced me that the Chromebooks are a positive tool for classroom use.

Limitations of this Study and Suggestions for Future Research

There were several limitations to this study. First, this study only focused on one subject. Other researchers may wish to look outside of social studies, into subjects such as science or math. Another limitation is that this study only evaluated the Chromebook in high school classrooms. Studies conducted in middle and elementary schools may produce different results, and other researchers should examine those possibilities. This study also only looked at the Chromebook. While it provided a lot of information about the Chromebook, it does not provide any sort of direct comparison to other digital devices that a district may select for their 1:1 initiative. The lack of other devices could limit this study's usefulness to a school district trying to choose their 1:1 device. If future researchers completed a device comparison study, that could be very useful to school districts.

Conclusion: The Overall Significance of this Study

This study functioned as a case study of Chromebooks. It focused on how high school social studies teachers used them in their classrooms. This study now serves as a resource for teachers and school decision makers because of that. I hope that teachers can gather information on the Chromebook, particularly on how other teachers successfully integrated them into their classroom. I also hope that administrators and other decision makers have more information at their disposal to help them make informed decisions as to if a 1:1 initiative is right for their district, along with what type of device they should pick. Overall, my goal was for the reader to take away that the Chromebook can greatly enhance the infusion of disciplinary literacy practice

in the classroom, while providing many other benefits as well. I want my readers to get past the misgivings I myself had, so that they can reap the benefits of the Chromebook.

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Participant Name: _____

Date: _____

Appendix A
Chromebook Research Questionnaire

Directions: Please answer the questions/statements below. The first few are a short written response. The rest will be questions on a 1 (strongly disagree) to 5 (strongly agree) model. Below each question/statement will be a spot for you to leave comments, if you choose to do so. You are welcome to leave any question blank that you prefer not to answer. You may also write N/A in the comments if you do not think a question applies to you. If you would like additional room for comments (question-specific or general), there is an additional page for extra comments attached.

1. How many years have you been teaching? _____

2. Please list below the subjects that you teach:

3. I use the Chromebook every day in my instruction.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

4. I believe that the Chromebook is a highly efficient piece of technology (referring only to the technology, not pedagogy).

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

5. The Chromebook offers a unique opportunity to teach that I otherwise would not be able to employ.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

6. The Chromebook enhances my instruction.



Comments:

7. I can tailor use of the Chromebook to fit into my lessons easily.



Comments:

8. The Chromebook is an effective tool for enhancing social studies content.



Comments:

9. With the Chromebook, I can more effectively deliver content and instruction to my students.



Comments:

10. I can teach social studies content more effectively with the Chromebook than I could without.



Comments:

Disciplinary literacy is a term that refers to the skills needed to appropriately interact with, interpret, and become consumers of a specific discipline. It is an extension that goes beyond basic reading comprehension strategies and emphasizes skills. In Social Studies, it involved how teachers help students to specifically interact with and understand historical information and artifacts. It does not just refer to skills in understanding the textbook, but the ability to interpret primary sources as well. Disciplinary literacy is a student's ability to act and think like a historian. Please keep this definition in mind when answering the remaining questions. You may also pause taking the questionnaire and contact the researcher if you would like further clarification on the term disciplinary literacy.

11. I have a strong understanding of the concept of disciplinary literacy.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

12. Disciplinary literacy is an important part of a high school social studies classroom.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

13. I incorporate best practice in regards to disciplinary literacy in my classroom.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

14. The Chromebook influences disciplinary literacy in my classroom.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

15. The Chromebook has a positive influence on disciplinary literacy in my classroom.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

16. The students are familiar with the technology, and can use it effectively.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

17. I find that my students are constantly distracted by their Chromebooks, and it negatively impacts instruction.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

18. My students feel that the Chromebook helps them learn.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

19. Overall, I find the Chromebook useful, and hope to continue to use it in my classroom.

1 2 3 4 5
Strongly disagree ←—————→ Strongly agree

Comments:

Please write any additional thoughts or comments you would like to share below:

Appendix B

Chromebook research – Interview Questions Template

The following questions will guide the conversational style interview. The researcher may take some notes on this page or separately in his notebook, but will audio-record the interview and transcribe it later.

1. In what ways do you utilize the Chromebooks in your Classroom?

2. How do you feel about the Chromebooks?

3. How does the Chromebook affect your instruction?

4. What are some constraints or issues with the technology or the implementation of the technology? Please explain.

5. How, if at all, is your use of the Chromebook tailored to Social Studies?

6. How prepared did you feel to use the Chromebook at the start of the school year? How do you feel now?

7. What level of comprehension do students have of the technology?

8. How do students respond to the technology?

9. How would you define disciplinary literacy in the classroom? Why do you define it that way?

10. What does disciplinary literacy mean in a social studies classroom? Can you provide some examples?

11. In what ways do you strive to teach disciplinary literacy in the classroom? Can you provide some examples?

12. How does the Chromebook impact disciplinary literacy in your classroom? Can you provide some examples?

13. Has your pedagogy evolved with the implementation of the Chromebook in your classroom? Try to think of your understanding of disciplinary literacy and if that has evolved at all as well.

14. Can you describe to me a lesson that changed because of the Chromebook?

15. Are there any other thoughts you would like to share with me?

Appendix C

IB HOTA Internal Assessment

Join the IB HOTA 11th Grade Internal Assessment -> Class Code: *****

Due Date: Uploaded to Google Classroom on Sunday, April 2, 2017 by Midnight

Purpose of internal assessment

Internal assessment is an integral part of the course and is required for all students. It enables students to demonstrate the application of skills and knowledge. Students will develop and apply the skills of a historian by analyzing a range of source material and considering diverse perspectives. The activity demands that students search for, select, evaluate and use evidence to reach a relevant conclusion consistent with the evidence and arguments that have been put forward.

Please note: Each individual student must complete an individual historical investigation—group work may not be undertaken. The historical investigation submitted for internal assessment must be the student's own work.

Historical investigation

The historical investigation is made of up three sections.

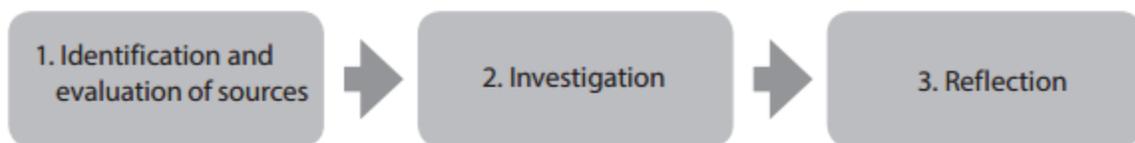


Figure 8
Historical investigation

Topics:

Students will be assigned one of the following investigation topics and questions:

Investigation Topic	Investigation Question
Japanese-American Internment	To what extent was the internment of Japanese-Americans justified?
Dropping the Atomic Bomb	To what extent was dropping the atomic bomb on Japan justified?
Black Equality	To what extent is the American Dream a reality for black Americans?
Women's Rights	To what extent do women need an Equal Rights Amendment?

Section 1: Identification and evaluation of sources

This section requires students to analyze in detail **ONE** of the sources that they will use in their investigation. The source must be one of the provided primary sources.

In this section students must:

- clearly state the question that they are investigating (this must be stated as a question)

- include a brief explanation of the nature of the source selected for detailed analysis, including an explanation of its relevance to the investigation
- analyze one source in detail. With reference to the origins, purpose, and content, the student should analyze the value and limitations of the source in relation to the investigation.

Section 2: Investigation

This section of the internal assessment task consists of the actual investigation.

The investigation must be clearly and effectively organized. It must contain critical analysis that is focused clearly on the question being investigated, and must also include the conclusion that the student draws from their analysis.

In this section, students must use **ALL** of the provided sources to support their argument.

Section 3: Reflection

This section of the internal assessment task requires students to reflect on what undertaking their investigation highlighted to them about the challenges facing the historian.

Students must choose **TWO** questions from the list below for reflection and answer each question in a well-developed paragraph. Students must support their generalizations with analysis and the inclusion of supporting facts, examples, and details.

1. How can the reliability of sources be evaluated?
2. Who decides which events are historically significant?
3. Is it possible to describe historical events in an unbiased way?
4. What is the role of the historian?
5. If it is difficult to establish proof in history, does that mean that all versions are equally acceptable?

Bibliography

A bibliography and clear referencing of all sources must be included with every investigation, but these are not included in the overall word count. Students are required to use MLA format and in-text citations. It is recommended that you use www.easybib.com or <http://libguides.monroe2boces.org/hhscitingsources> as a reference.

Word limit

The word limit for the historical investigation is **850-1250 words**. A bibliography and clear referencing of all sources must be included in the investigation, but are not included in the overall word count. Below are suggested word allocations for each section of the historical investigation. Please note that these word allocations are suggestions only.

Section	Suggested word allocation	Associated assessment criteria	Marks
1. Identification and evaluation of one source	200-300	A. Identification and evaluation of one source	7 marks
2. Investigation	500-750	B. Investigation	14 marks
3. Reflection	150-200	C. Reflection	3 marks
4. Bibliography	Not applicable	D. Bibliography	1 mark
Total	850-1250 words		Total: 25 marks

Internal assessment criteria**Criterion A: Identification and evaluation of sources (7 marks)**

Marks	Level Descriptor
0	The work does not reach a standard described by the descriptors below.
1-2	<p>The question for investigation has been stated. The student has identified and selected an appropriate source, but there is little or no explanation of the relevance of the source to the investigation.</p> <p>The OPCVL chart is not completed, inaccurate, imbalanced, or lacks a depth of understanding.</p> <p>The response describes, but does not analyze or evaluate the source.</p>
3-5	<p>An appropriate question for investigation has been stated. The student has identified and selected appropriate source, and there is some explanation of the relevance of the source to the investigation.</p> <p>The OPCVL chart is completed in detail, may contain some imbalances among the five components or may have minor errors.</p> <p>There is some analysis and evaluation of the source, but reference to its value and limitations is limited.</p>
6-7	<p>An appropriate question for investigation has been clearly stated. The student has identified and selected appropriate and relevant source, and there is a clear explanation of the relevance of the source to the investigation.</p> <p>The OPCVL chart is completed in detail with a balance among the five components.</p>

	There is a detailed analysis and evaluation of one source with explicit discussion of the value and limitations of the source for the investigation, with reference to the origins, purpose, and content of the source.
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Criterion B: Investigation (14 marks)

Marks	Level Descriptor
0	The work does not reach a standard described by the descriptors below.
1-3	<p>The investigation lacks clarity and coherence, and is poorly organized. Where there is a recognizable structure there is minimal focus on the task.</p> <p>The response contains little or no critical analysis. It may consist mostly of generalizations and poorly substantiated assertions. Reference is made to evidence from sources, but there is no analysis of that evidence.</p>
4-6	<p>There is an attempt to organize the investigation but this is only partially successful, and the investigation lacks clarity and coherence.</p> <p>The investigation contains some limited critical analysis but the response is primarily narrative/descriptive in nature, rather than analytical. Evidence from sources is included, but is not integrated into the analysis/argument.</p>
7-9	<p>The investigation is generally clear and well organized, but there is some repetition or lack of clarity in places.</p> <p>The response moves beyond description to include some analysis or critical commentary, but this is not sustained. There is an attempt to integrate evidence from all sources with the analysis/argument.</p> <p>There may be awareness of different perspectives, but these perspectives are not evaluated.</p>
10-12	<p>The investigation is generally clear and well organized, although there may be some repetition or lack of clarity in places.</p> <p>The investigation contains critical analysis, although this analysis may lack development or clarity. Evidence from all provided sources is used to support the argument.</p> <p>There is awareness and some evaluation of different perspectives. The investigation argues to a reasoned conclusion.</p>
13-14	<p>The investigation is clear, coherent and effectively organized.</p> <p>The investigation contains well-developed critical analysis that is focused clearly on the stated question. Evidence from all provided sources is used effectively to support the argument.</p> <p>There is evaluation of different perspectives. The investigation argues to a reasoned conclusion that is consistent with the evidence and arguments provided.</p>

Criterion C: Reflection (3 marks)

Marks	Level descriptor
0	The work does not reach a standard described by the descriptors below.
1-2	The reflection demonstrates little awareness of the challenges facing the historian and/or the limitations of the methods used by the historian. The connection between the reflection and the rest of the investigation is implied, but is not explicit.
3	The reflection demonstrates clear awareness of challenges facing the historian and/or limitations of the methods used by the historian. There is a clear and explicit connection between the reflection and the rest of the investigation.

Criterion D: Bibliography (1 mark)

Marks	Level descriptor
0	Failed to include a properly MLA formatted bibliography and/or in-text citations.
1	Included a properly MLA formatted bibliography and in-text citations.

In-Class Gradebook Conversion:

Rubric Score 25 total	Gradebook Score 200 total		Rubric Score 25 total	Gradebook Score 200 total
25	200=100%		12	149=75%
24	198=99%		11	142=71%
23	194=97%		10	138=69%
22	190=95%		9	134=67%
21	186=93%		8	130=65%
20	184=92%		7	126=63%
19	182=91%		6	120=60%
18	180=90%		5	114=57%
17	178=89%		4	108=54%
16	172=86%		3	100=50%
15	166=83%		2	0=0%
14	160=80%		1	0=0%
13	154=77%		0	0=0%