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TYLER DETTMANN
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HIGH SCHOOL SOCIAL STUDIES TEACHERS NAVIGATING IN ONE-TO-ONE CLASSROOMS

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BY

Dr. Kristy Brugar, Chair

Dr. Theresa Cullen

Dr. Neil Houser

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Abstract

Do teachers change their pedagogical decisions once they receive greater access to technology? This study aims to evaluate the extent to which social studies teachers, both those who grew up with technology (digital natives) and those who did not (digital immigrants), in a district implementing a one-device-per-student policy changed their pedagogical strategies for using the devices. Through interviews and observations, it seems that just providing the devices was not enough, but that teachers reported a need for professional development and clear articulation of usage to truly change their teaching. On the other hand, solid pedagogical strategies developed by years of experience in the classroom appeared to be more important than familiarity with technology for creating new learning opportunities.

High School Social Studies Teachers Navigating in One-to-One Classrooms

Personal Connection to the Research

Introduction

I began my teaching career in 2013 working at a middle school within the district I currently teach. After one year at the middle school, I moved to the high school level, where, over the last five years, I have taught almost every subject offered within our social studies department from Oklahoma History to United States history and U.S. Government, both Advanced Placement (AP) and non-AP offerings. During my first year teaching within the district, the community voted on a bond issue to renovate schools within the district and invest heavily in an initiative aimed at providing every secondary student within the district with a device to try and close the gap between individuals of different socioeconomic statuses. This claim seemed to echo the National Education Technology Plan, which "acknowledges the continuing need to provide greater equity of access to technology" (U.S. Department of Education, 2017). To do so, the distract had allotted nearly 20% of a $126 million bond issue towards the technology – a hefty sum that, while aiming to close the digital divide (the first stated goal of the initiative), nonetheless represented a significant expenditure for the district, which could therefore impact the district's expectations of usage of the investment. These devices, which included MacBooks for every high school student and faculty member, were finally distributed for student usage during the fall of 2017. I was cautiously optimistic heading into the semester.

Through my educational career, I had been excited to think about the possibilities technology could offer to my students beyond what is capable in the classroom. But I was concerned that, with the large investment committed by the district to the devices, the computers

would become mandated within the classroom, rather than serving as an additional tool for teachers. I was also worried the devices might not be used properly by students given free reign, and hoped the district would have a solution to monitor student usage.

With this mindset, I wanted to grow as a teacher as well as investigate what successes my colleagues were having with the usage of devices within their classrooms and content areas. I developed this study which has allowed me to measure their experiences within the classroom for my own personal growth, while providing insight and recommendations for other districts looking at implementing the one-to-one model successfully.

Research Problem

For many in our society, technology has become an increasingly important extension of who we are as people. To this end, many of the students entering schools today (who were born after 1980) have been labeled "digital natives," or those who have grown up in a technology-saturated environment (Prensky, 2001). To keep up with the challenges of educating students who have access to vast stores of information, often via nigh-ubiquitous smartphones, many schools are adopting technology at a rate of one device per student, sometimes referred to as "one-to-one." As students gain access to this technology, their teachers are asked to adapt their teaching styles to include the technology as a curricular tool, enabling them to create or extend beyond what the typical, general education classroom affords. By developing lessons using devices as tools which enhance the learning experience, teachers can develop constructivist lessons which present opportunities for students to be initiators of their own learning.

Though some younger teachers would be labeled digital natives themselves, and may be familiar with different applications of technology already, many veteran teachers (born prior to 1980) are labeled "digital immigrants" (Prensky, 2001) who may lack comfort with the

technology, making them less aware of what the technology is capable of in an instructional capacity and less prepared to use technology to engage in historical inquiry (Callahan, Saye & Brush, 2015). Districts adopting one-device-per-student models often expect teachers to use technology to change their classrooms; however, these teachers (both digital natives and immigrants) may not have the background or training necessary to truly implement the devices in an innovative manner, which compromises the original purpose of the technology.

Social studies teachers in particular deal with issues related to their pedagogy. Much of the basic content in history classes (the majority of K-12 social studies classes) can be easily found via internet searches. To create a more engaging classroom, social studies teachers can leverage technology to enable constructivist lessons within their classrooms. Maintaining students' interest in lessons, rather than simply using search engines to find the right answer, presents new challenges for social studies teachers, who have often been used to serving as the gatekeeper to their students' learning. This study aims to give qualitative insight to the experiences of secondary social studies teachers in the first-year implementation of one-to-one devices within a singular district. It compares these experiences to provide insights and may offer suggestions to districts looking to implement one-to-one models to help them integrate the devices more successfully.

Literature Review

To orient my research, I will connect the purposes of my study and the development of my research questions to already established research. This includes connections to technology usage, professional development, and social studies instruction as a whole.

Usage of Prensky's Dichotomy and Potential Issues

The labels of digital immigrant and digital native, developed by Prensky, have been chosen to more easily distinguish between teachers who have been exposed to modern technology in childhood or not. However, Prensky's model has not escaped criticism, in particular to its assumptions of the capabilities of digital natives and immigrants. For one, research has demonstrated digital native teachers "may use technology more frequently for maintaining social connections or pursuing personal interests... but were not identified as key factors affecting teachers' technology integration" (Wang, Hsu, Campbell, Coster & Longhurst, 2014, p. 654). Additionally, some digital immigrant teachers have more of a propensity for usage of technology, and thus may have more familiarity with educational uses of technology than their digital native peers – or may have no difference in ability whatsoever (Guo, Dobson & Petrina, 2008). Though criticism of Prensky's model reflects a need to check the extent to which his dichotomy actually reflects a difference between more seasoned teachers and newer teachers, I will use the two terms to work within his established framework.

The One-to-One Model's Purpose

The one-to-one device model generally is applied by districts trying to solve two problems: (1) growing economic inequality between students, especially as it relates to technology, and (2) most 21st century jobs require more intimate technological knowledge (International Society for Technology in Education, 2016). One-to-one models also address issues surrounding digital natives and digital immigrants – empowering digital native students to address their learning needs in the classroom, while also enabling digital immigrant teachers to use technology to support their teaching (Prensky, 2001). According to the National Technology Education Plan (2015), by increasing the degree to which education and technology are

intertwined, educators can potentially close gaps created by economic inequality while also preparing students for employment in an increasingly technologically-driven society.

Within classrooms, then, integration responsibilities of one-to-one devices into content areas falls on the teacher. This impetus has caused teachers to not only evaluate what content they need to teach and how they teach it, but also what technology they can use to supplement their pedagogy (Koehler & Mishra, 2009). It is tempting for many teachers to default to simple replacement – whereas they may have used paper to assignments in the past, now they can use word processors – but technology offers many more possibilities (Hamilton, Rosenberg & Akcaoglu, 2016). Specifically, because each student has access to their own device, they can now be empowered to engage in constructivist-based lessons, or lessons putting control of learning in the hands of students (Ertmer & Newby, 1993). The meaning-making students engage in is localized to their personal contexts, which leads to individualized learning and greater chances of long-term retention. In doing so, students can use technology to more deeply explore content, rather than searching for the cursory answers generally required in a typical classroom. My participants report on the degree to which they feel they are successfully engaging students at this level, and also describe the challenges in doing so, providing qualitative insight into the success of the one-to-one model's goal.

Benefits and Challenges of the One-to-One Model

The one-to-one model has brought many changes to the 21st century classroom. Quantitative studies have noted more frequent usage of technology to create student-centered learning experiences (Lowther, Inan, Ross & Strahl, 2012). These lessons are educative and constructivist in nature. Qualitative studies have revealed a higher degree of student engagement in lessons using technology for constructivist lessons (Shifflet & Weilbacher, 2015). As teachers

have embraced the possibilities of technology to enable student access to information, they have generated more worthwhile learning experiences for their students. But these experiences did not happen simply as a result of increased technological availability.

Professional Development and Technology

Professional development for teachers has been discussed often, noting it needs to have a "disposition of inquiry" and be "centered on the development of practice and practitioners" (Ball & Cohen, 1999). Further literature agrees with the sustained approach to professional development, suggesting also it be "hands on work… integrated into the daily life of school" to create the greatest possible effect for teachers' practice (Garet, Porter, Desimone, Birman, & Yoon, 2001). Professional development should be designed specifically for teachers, aiming to connect theory to their practice, and remembering teachers are also learners themselves – which requires professional development to create meaningful experiences if it is to be considered effective (Darling-Hammond, 1998).

As it relates to the usage of technology in a one-to-one classroom, it appears professional development, in both helping teachers create constructivist lesson plans and informing them of the possible uses of technology, enables teachers to create these experiences over time, which means simply providing computers will not instantly address all ills (Callahan, Saye & Brush, 2015). This is especially important for problem-based historical inquiry (Brush & Saye, 2008) – this system uses technology to engage students in primary source analysis, application of historical principles to contemporary problems, and creation of projects not available in the classroom without technological access. These units require a lot of planning ahead by the teacher to engage students at a rigorous level – time teachers are often lacking. Professional development becomes almost as important, then, as teacher retention – teachers leaving impairs

the ability of subject area teachers to engage in longitudinal lesson and curriculum development. My participants share their professional development experiences to help illustrate the importance of professional development

Usage of Technology within the Classroom

To help prepare for technology usage within the classroom, the International Society for Technology in Education [ISTE] has published both standards and competencies for students, educators, and leaders. Included in these standards are goals for allowing students to create and research using technology, which is modeled in the educators' standards (ISTE, 2016). These standards are being used not only in many classrooms and schools around the nation, but are also being taught to pre-service teachers, further helping prepare digital native teachers for advanced classroom usage.

The one-to-one model has been effective for various classrooms in accomplishing this vision. In particular, by giving each student their own device, they are more likely to "use productivity and design tools in ways that are integrated into other classroom activities and assignments" – that is, by having a device, they see better possibilities for the usage of the technology than if the technology is not individual and student-assigned (Penuel, 2006). This success demonstrates the one-to-one model has strengths for achieving equity of achievement for all students.

While there has been reported success across many studies with reaching the goals of the ISTE standards in one-to-one classrooms, some concerns remain. Zheng, Warschauer, Lin & Chang (2016), in a review of studies related to one-to-one initiatives, found that while these studies all seemed to agree that the one-to-one model led to a "promotion of 21st-century learning skills," that there was not an operationalization of growth of these skills, nor a successful

measurement of the skills prior to the studies among the participants (p. 1074). Additionally, while many studies focus on student achievement, there appears to be a gap in the literature that follows the impact on teachers' pedagogical choices related to one-to-one initiatives.

One-to-One Models within the Social Studies Classroom

Within the social studies, technology has played a growing role in the 21st century. The largest growth area has been in the development of educational games to help students address content. While video game play has demonstrated value to some educators who tie their required curriculum to video games based on their standards (Maguth, List & Wunderle, 2015), there seems to be skepticism among veteran teachers of the value of video games within the social studies classroom – it may be attributed to generational factors, or simply a lack of experience with "serious" video games, or games simulating the "real world" (Gaudelli & Taylor, 2011). In other classrooms, online applications and platforms are allowing teachers to move more mundane work to technology, granting them more time in the classroom to engage in deeper lessons (Van Vaerenewyck, Shinas & Steckel, 2017).

For social studies teachers in a one-to-one classroom, there is a gap of qualitative information regarding the first-year implementation of device-per-student policies within individual classrooms. Teachers in one-to-one environments can use their computers to provide digital notebooks, where students can practice new content; digital texts, such as electronic field trips or e-books, to allow students to deepen their knowledge; and digital internships, where students can simulate real-life work skills virtually (Shaffer, Nash & Ruis, 2015). Teachers can also use technology to supplement writing approaches fundamental to social studies curriculum (Dingler, 2017), or engage in historical inquiry where students explore the lives of people to appreciate their social and historical contexts (Waring & Bently, 2012). But while there is much

research on the methods of how social studies teachers can use technology and ideas for the devices' applications in the classroom, there is not much exploration into the experiences, both positive and negative, of teachers implementing devices within the first year of availability. This is where the experiences of my participants will prove very useful – they can help illuminate different strategies they have applied within their classrooms and the track their growth through the first year.

Research Questions

In this study, I explore three primary research questions:

- How does a teacher's background with technology influence his or her efficacy in using technology for pedagogical methods?
- What successes and frustrations have teachers encountered when trying to use technology to create constructivism-based lessons?
- To what degree do teachers feel pressured to use one-to-one devices within their classroom, and what support have they been provided that might justify the pressure they feel?

Theoretical Framework

This study is dependent on three theoretical frameworks: digital native/immigrants, technological pedagogical content knowledge (TPACK), and constructive education. I compare teacher responses to technology by looking at their labels as identified in Prensky's definitions of "digital natives" and "digital immigrants" (2001). I will then contend his definitions with my findings to further discuss the accuracy of his labels and his findings a decade and a half afterward. Though his labels are useful for separating novice teachers from veteran teachers in their experience with technology prior to entering the teaching field, the qualitative data I present

challenge his assertion students are learning differently and old teaching methods are becoming outdated (2001). I use his labels to truly gauge whether growing up with technological access truly leads to more knowledge of how to apply technology to constructivist practices in an educative setting.

I also look at technological pedagogical content knowledge (TPACK) and the role it plays in selection and usage of technology for constructivism within the classroom (Koehler & Mishra, 2009). TPACK measures three aspects of teaching: the technology teachers use to enable their teaching, the content, which they instruct students in, and the pedagogical strategies they apply to teach their students. TPACK then measures the extent to which these three aspects of teaching overlap. I apply this to the teachers' self-reported efficacy in content knowledge, pedagogical strategies, and technology usage to try and cross reference Mishra and Koehler's framework with my qualitative data. I try to assess, based on participant responses and observations, where teachers may feel their different technological, pedagogical, and content knowledges lie and how they help them create constructivist lessons in the classroom.

In the social studies classroom specifically, I look for the problem-based historical inquiry model (Brush & Saye, 2008) supported by multimedia accessible via the students' devices to assess the degree to which constructivist lessons occur within the classroom. I have chosen this framework because of its incorporation of specific historical tools (including historical changes and continuities, primary document analysis, and application of historical concepts) with technologically-based strategies allowing a student to engage history based on their own interests in problem-solving, matching constructivist goals. Though the participants surveyed do not necessarily teach history, but instead some other social studies discipline, the

varying tools of historical analysis, including document synthesis and social research, lend themselves to evaluating constructivism in other social studies disciplines.

Research Design

For the purposes of this study, I use a cross-case study approach to compare five different teachers to make emergent trends and patterns (Cresswell, 1997). In doing so, I hope to generalize the participants' experiences and use them to provide suggestions based on these trends and patterns. Because of the individuality of each teacher, cross-case study will prove most useful in finding these data as I seek to understand the participants' pedagogical and structural decisions which influence their teaching. By using this glimpse into their lives as teachers, it is my hope the implementation of one-to-one devices in social studies classrooms can be improved across the board. I also hope their experiences as teachers, not necessarily just within the social studies, can be generalized to the profession as a whole, becoming applicable to districts looking to implement the one-to-one model of instruction.

Participants

My sample consisted of give social studies teachers (see Table 1) who worked at Worcestershire High School, a suburban, university-town high school. I know each of the five participants personally, which can impact the findings of my research. For example, one of the participants worked with me as a student teacher. Another one of the participants was my mentor teacher when I was a student teacher myself. A third was a classmate of mine during my undergraduate studies. I have worked in the school for five years and have developed curriculum, collaborated with, and developed personal relationships with each of the participants. Coincidentally, four of the five attended the same university for their undergraduate, with the fifth having a connection to the same university. Two of them are even graduates of the high

school we teach at. I describe all of this to show crosscutting descriptors of my participants. While these factors might lead to me editing the results to portray my coworkers more favorably, or to their exaggeration of their successes to support my study, I used triangulation within my data collection to help remove these biases and gather a true picture of the participants' experiences.

Table 1.

Participant Descriptions

Name of Participant	Digital Immigrant or Native	Years Teaching
Eleanor	Immigrant	6
Marge	Native	2
John	Immigrant (with technology experience)	14
Lucy	Immigrant	24
Freya	Native	4

To institute the one-to-one initiative, a bond issue of more than $16 million from the district provided an individual MacBook Air to each high school student within the district. Each teacher was also provided with a MacBook with the intention of creating equity to technological access for students. This provided the ability to use the new technology to access teaching strategies that may have previously been unavailable. Teachers within the district were given two days of professional development, including one focused day on simple MacBook functions, and the other with a choice in sessions of a few technologies that could be used in the classroom. The study began in the first semester of implementation within the district.

Data collection and sources

Over a 12-month period, I conducted interviews (individual and focus group), collected self-reported technology logs from each teacher and observed each teacher monthly. I interviewed these teachers to gain their own insights on how they are using the devices within their classroom. First, I conducted an initial 30-minute semi-structured interview to gauge the teacher's view on technology in the classroom (see Appendix A). The interview also touched on questions about successes and challenges related to the implementation of one-to-one policies within classrooms, perceived pressure from the school district about usage of the devices, and their own experiences with technology beyond a curricular setting. This provided a starting point for the study, and offered the opportunity for comparison as the study progresses. I conducted additional interviews with the teachers as the study continued to either seek more feedback on how they changed their teaching within the classroom or to serve as reflection on how their usage of technology had changed. These interviews occurred monthly and lasted up to ten minutes, following observations of the classroom.

To augment teacher interviews, I observed classes of these teachers monthly, recording the degree to which teachers successfully engaged students with technology (see Appendix B). These observations took place during different times of the school day in the participants' classrooms as my schedule allowed. There were no expectations for technology to be used - I wanted teachers to know I was observing them on a typical class day. During the observation, focus was only on the teacher, as the goal was to measure how teachers used technology within their classroom, independent of student usage. This helped provide insight into the success of their methods. I sought feedback from participants regarding my observations after they were completed to ensure I had not misrepresented what I observed within their classes.

Additionally, the participants were task with completing a "technology log", asking them daily how many minutes of a 54-minute period they used technology. The log was left intentionally vague so as to further gauge what the participants viewed as usage of technology within the classroom. This quantitative data helps reveal the degree to which the technology was used in the participants' classrooms (Appendix C).

Data Analysis

To analyze my data, I used an inductive analytical approach. This approach seemed most clear to comparing the cases of the participants studied. The usage of technology would not have been an easy phenomenon to distill, and though the individual stories of participants would have led to an insightful narrative, I wanted to make sure my own biases in the crafting of their narrative were limited.

To analyze these data, I transcribed all of my interviews verbatim. I used my classroom observations and the transcriptions to member check what my participants had reported. I began by separating the transcripts into different segments using my planned interview questions as different segments. I used initial coding on the interviews and the observations to look for common themes between the success teachers have with implementing the technology in their classroom (Shank, 2002, pg. 129). The initial codes were often *in vivo* codes, or codes based on direct quotation, used to try and keep the coding close to the data (Charmaz, 2006). From this initial coding, I created units of analysis by looking for similar *in vivo* codes I grouped together to form new secondary codes. From these categories, I used domain analysis (Spradley, 1979) to develop common, broad themes, and I augmented this information with the quantitative data from the technology log. Finally, I used abductive reasoning to combine these elements into larger themes describing the successes or challenges experienced by teachers, both in the initial

implementation, as well as long term implementation of these devices throughout the ten-month study (Shank, 2002, pg. 130).

Trustworthiness

I used methods of data triangulation to ensure participants were fairly represented during my study. These included a review of my verbatim transcriptions with my participants after interviews to ensure I had accurately captured their meaning, and the observation protocol allowed for follow-up questions to clarify observed phenomena during classroom observation. *In vivo* coding was used initially to make sure the codes I selected came directly from the meaning of what the participants articulated (Saldaña, 2016). In this way, I avoided adding my own biases through the selection of codes, which were later used for grouping findings together to better illustrate the themes emergent from my data. Lastly, I showed participants a draft version of my findings to ensure I had accurately represented their views and experiences, confirming I had not misrepresented anything they had communicated.

Ethical Issues

There are no obvious ethical issues with my data. Participants have been given a pseudonym to protect their anonymity, identifying information has been removed from any data, and data collected from the participants initially, including recordings of interviews, have been destroyed after verbatim transcription, member checking, and one final review I made prior to ensuring meaning had been captured accurately in the transcription process. There are no protected groups involved in the study, consent forms were obtained from each participant, and the study itself was approved through both the University of Oklahoma and Worcestershire Public Schools institutional review boards. A final copy of my findings and discussion will be

submitted to both institutions for review, and can also be used by the school district to evaluate the successes and needs of its one-to-one initiative.

Findings

Theme One: Both digital native and digital immigrant teachers reported they *wanted* to use technology within their classroom, but appeared to feel unprepared to do so.

The teachers consulted for the study indicated they desired to use technology for constructivist purposes within their classroom. Digital natives, who felt more familiar with technology and its uses, seemed to value the practicality of technology within the classroom. Marge, a second-year digital native teacher, believed "everyone has smartphones now, so there's really no excuse as far as not knowing... how to get things done." Freya, in a poignant comment, indicated she "could do things that can't happen in a classroom lacking technology. [She] could show students images and videos that can't be found anywhere else." In observations of these teachers labeled digital natives, technology usage was the most frequent. Only two observations showed a lesson not majorly entwined with a technological aspect. Despite this, the usage of technology was not often for constructivist purposes. The usage in the lessons often served as a replacement for typical classroom techniques. These included, in the case of Freya, posting of documents on a digital classroom platform, the recording of thoughts on Google Documents, and image analysis via the devices. All of these instances could have been recreated using other means. In the case of Marge, PowerPoints were used to help organize lectures, and students were often sent to discover answers to questions using internet resources, but again, they lacked constructivist purposes. Instead, it seemed the technology was being used for ease of purpose instead of for innovation.

The digital immigrant participants, on the other hand, felt they had learned enough in their day-to-day living to be comfortable with the role technology plays in society. One of the more veteran participants, Lucy, noted she was "surprised at how suddenly I have used it all the time." John explained a different set of circumstances for himself:

> I didn't necessarily grow up with a computer everywhere, but my brother was always kind of a geek so we had one around. So, I learned to use it, but this was very early computer stuff, you know? So, the stuff the kids have now, it's game changing, but the secret for me is... that I already kind of know how to use this stuff before they do. So I can just use that to my advantage.

Many of the teachers did indicate there were significant challenges in implementing the technology, specifically a lack of preparation and time, prevented them from using the technology more than cursorily. One teacher, Eleanor, noted "this is new to us and trying to figure it out… is complicated." This seemed a commonality for the teachers: an unfamiliarity with the capabilities of different computer resources meant teachers could not use the technology for constructivism-based lesson planning. However, teachers remained optimistic the technology would be easy enough to figure out given time and guidance. Eleanor claimed "just because [she] doesn't know how to do it doesn't mean somebody won't teach [her] how to do it." Freya noted a willingness to experiment and allow students agency with the technology in her classroom:

> Sometimes... I don't even know these platforms that I'm assigning to kids because... they can just figure it out! How many times have [we] had something thrown to us as teachers that we just kind of mess with and... and just make something happen? So why can't kids do that too?

Eleanor and Freya's responses seems to reflect optimism indicating just because teachers did not receive the initial guidance that would have led to a more successful implementation does not mean technology could not still be used for constructivist purposes. Lucy even looked towards a more unconventional source for learning new technologies: "kids know more about the platforms than I do... that doesn't bother me." Marge seemed to take a more utilitarian approach toward the usage of technology when she admitted "I want them to be as prepared as possible, so that when they get to college, they're not really freaked out about how college is compared to here." From classroom observations, it appeared while technology usage was indeed more prevalent among those who would be labeled digital natives, they used it for different purposes than the more pedagogically-developed digital immigrants.

Theme Two: A lack of time appeared to play a role in teachers' ability to use devices for constructivist lessons.

Across all of the participants, regardless of technological experience, a lack of time was frequently cited as being a factor in how they plan lessons involving technology. For the digital native teachers, the lack of timing played more of a role in the pedagogical selections of lessons. Marge elaborated:

> I sometimes have to just… wing it with technology… like, I have some time left over at the end of the lesson so it's, like, 'hey, everybody, use your MacBook for this.' Sometimes, I can plan it when I have a great idea for a lesson… like, 'oh hey this is a great idea' but other times it's just… I do it when I can to just use the devices.

For Freya, the results looked a little bit different - "I know how I want to teach the kids, and sometimes it's just sitting down and deciding what technology would work best... but I sometimes just find myself falling into patterns of what I already do, not using new technology."

For both of the digital native teachers, the technology appeared to be an afterthought, or was a secondary concern to the content or pedagogical goals of the lesson.

For digital immigrant teachers, the concerns with time seemed to stem more from the time lesson planning required for more constructivist lessons. For John it was simply about time demands, noting "I have three kids, man, and I teach a zero hour [an extra class for teachers at his school]... I have three preps, so designing entire lessons around technology, and hoping it works, and hoping that my students will do it? It can be frustrating." On the other hand, Eleanor discussed the importance of time for learning new technological skills, describing it as:

> I just don't have time to… look, there's a lot of, um, good stuff out there. Just last week I learned about Canva, and that is really, really cool - it lets kids create stuff… but I mean, when would I have found out about this? I get off of work and I'm busy grading or lesson planning, and I just… I just don't have the time to explore all the different platforms out there. Sometimes, I just wish they would all be on one single, um, site or one account that I could just… we could just log in to and access.

For Lucy, the timing of planning did not appear to be as important as the timing to collaborate. She described it as:

> I want to keep on the same schedule as the same teachers of my subject. We each teach our own way, but we should try to be on the same wavelength for technology, because if a project is good, shouldn't we want other students to do it as well? But that takes time to meet with our team, and we don't usually have that.

For digital immigrant teachers, who understandably have more experience with their content and their teaching strategies, it appears the lack of time led to less planning for or learning

technology rather than the digital natives, who seemed to spend more time on developing pedagogical or content strategies.

Of the participants, the digital immigrant teachers reported less usage of technology, and for fewer minutes per usage. Additionally, the digital immigrant teachers tended to be more descriptive in their usage of technology. Though they initially reported similar usages as the digital native teachers (using a computer for PowerPoint), as the study persisted, digital immigrants tended to report more constructive purposes, including digital image analysis, podcast-based lessons, or even a student-created documentary project.

Theme Three: Digital natives seem to be more likely to rely on technology because they feel pressure to use it, not necessarily because they apparently understand it better than digital immigrants.

Digital native teachers seemed to have pressures stemming from a few sources. Firstly, though no teacher reported a mandate or explicit directive to use the technology in their classroom, teachers were required to select "usage of technology" as one of their elements for teacher observations for the year, indicating their administration would be looking for ways they were using the devices in their classroom. Because of uncertainty surrounding contract status (most digital natives were working on temporary contracts), digital natives felt an obligation to justify their position in the district by using the district provided materials. Marge remarked she "hasn't been teaching as long, so I feel like I have to try and do… the new things and what the district wants me to do." Freya, who taught mostly in a different district (meaning her contract with the school district is still temporary), also claimed she "feel[s] like the district spent a lot of money on these [devices], and so [she] better try and use them." Lastly, it seemed digital natives who had recently graduated college felt pressure to use technology in their classroom to prepare

students for a university experience moving towards complete integration of technology. Marge explained this sentiment:

> So for me, what I try and do is I still do some of the paper stuff, that way it holds them accountable to actually turn something in and make them physically turn something in, as well as put a little bit of stuff on technology, because again, when they go to college, or whatever – they need to know how to use certain aspects of the computer, like e-mail, gotta check that every day, like an online forum, whether that be for classes or for your work schedule. Stuff like that.

On the other hand, digital immigrants, who tended to be career teachers, did not appear to feel the same degree of pressure, mostly due to their successful years of teaching and pedagogical knowledge. John identified this by claiming "every few years, [teachers] get something new to help... fix education, but to me, good teaching remains good teaching." Digital immigrant teachers, instead, seemed to worry about the pressure digital native teachers would face. Lucy expressed this by noting "new teachers are going to be pressured into using it a lot more than I am." Eleanor seemed to agree, saying "I have not personally felt [pressure]. Umm.. and maybe that's because I've been here for a while."

The technology logs collected reinforced this finding. Digital native teachers tended to record every instance of technology usage within their classroom, not specifically for constructivist purposes. This meant digital native teachers reported copious usage of technology - for PowerPoints that aided lectures, for videos shown on their personal computer, for word processing in place of writing. The reporting also made it difficult to discern when technology was used for constructive purposes for digital natives, because they did not tend to differentiate between instances of usages (i.e. when the student device was used to create access to a unique

experience or when it was used to word process). For digital natives, the technology log did not prove to be an effective method of triangulation of data.

On the other hand, while the digital immigrant teachers reported less usage of technology, and for fewer minutes per usage. They tended to be more descriptive in their usage of technology. Though they initially reported similar usages as the digital native teachers (using a computer for PowerPoint), as the study persisted, digital immigrants tended to report more constructive purposes, including digital image analysis, podcast-based lessons, or even a student-created documentary project. The lack of pressure felt manifested in a willingness to only utilize the technology when necessary.

Theme Four: Teachers seem to feel there a lack of control over their students' devices, and this might impact their willingness to design lessons that use them.

Based on responses from participating teachers, difficulty in implementing constructive lessons within their classroom seemed to stem from their perceived lack of control over their students' devices. No software had been installed on the laptops to allow teachers to monitor the students' computers, and as such, several of the teachers noted they actively avoided using technology to prevent misuse of computers. This has led to an abundance of distractions in the classroom – each teacher identified distractions as being something with which they had to contend. John said, for example:

> I actively avoid using the technology, because [students] use it for anything except the assignments that I give them. It makes it tough to fully embrace its potential for teaching. So, I use it when I can, but never more than I have to, because you just can't control [student usage].

Marge was more concerned about the classroom management aspect:

> Kids can pirate games online and find loopholes... Plus, there's 30 kids in here. It's hard to monitor everybody and be like 'Hey everybody, get off of YouTube"... It's just... they have to learn to monitor for themselves.

For Freya, her pedagogical strategies did not seem to match up with technological capabilities:

> I like doing simulations... and computers can't... they just can't be used for those. But when I do find something worthwhile online, it's just... tough, you know... to get... make sure that all the kids are doing just that.

Lucy, instead, focused on how much easier it was to redirect students without technology, in comparison to students who are using it:

> I can't help keep students on the right track, because I can't keep up with that many of them off course at the same time, if that makes any sense. Whereas, if we're doing or reading something out of anything, and somebody goes to sleep, I know they've gone to sleep. But if they're on the computer and we're doing something on the computer, I don't know what they're doing.

Eleanor took a more measured approach, identifying that students couldn't help be distracted with having access to technology for the first time:

> Yeah, there's a problem... we haven't taught them how to use it, and some of the kids don't have internet at home, and this is the place they get to have fun on their computers. I mean, I don't blame them, and we don't lock out different. I mean, we lock out some sites that should be, but I don't know.

Observation data backed these reports made by the teachers. During the observations, more time was spent by the digital native teachers ensuring compliance and proper usage of technology than by trying to create constructivist experiences. However, despite the teachers'

frustration, it was actually the digital immigrants who expressed more constructive approaches to technology than the digital natives – Eleanor noted she has students "keep a scrapbook… that worked much better on the computer than on paper." Lucy indicated "it affords me the opportunity to offer new things to kids I've never been able to do before. I teach differently than I used to because of it, but that's come on very gradually."

In this way, these teachers seemed to be more inclined to lean on their own pedagogical understanding, truly using the technology as a tool, instead of as the focus of lessons. In John's class, the technology seemed to be avoided because of its potential for distraction – he began classes by instructing students to put their devices away and only use them for approved purposes, which included synthesizing different texts in groups and combining their information via Google Docs sharing. I observed Eleanor's class in the middle of a project where students were researching an assigned figure from the margins of United States history and were then constructing a documentary about the figure. Though the usage of technology was for the whole class in this case, its purpose as a constructivist tool served to help students experience something not possible without device access. During observed classes, Lucy appeared to use technology to augment her story telling – when she would be discussing with students and a new topic would be approached, she would instruct students to "use their technology to look it up" and would follow the tangent to where she thought it logically ended. Observations of Lucy's classes reinforced her claim she uses technology for spontaneous information discoveries in class, allowing student connections to be made more readily due to technological access. It seemed digital immigrants were taking their lessons already constructive in nature and finding ways to implement them on computers, as they get more experience.

Theme Five: A lack of uniformity across teachers' classes may impact the amount of time teachers have to spend teaching technology, leading to fewer instances of constructivist applications.

Several of the participants indicated students were learning different technological applications and platforms in different classes, which led to frustration for the participants, who felt they had to teach students different examples of usage instead of knowing students were familiar with them. Freya provided an example: "I use Google classroom, and that works well… but sometimes kids say 'I use Edmodo in this other class' and then they get mixed up by what I expect." For Freya, this meant students "sometimes miss turning in something, because they don't remember how to do it on Google classroom." John offered a different take, explaining it was mostly his textbook students could access online giving him trouble. He explained:

> We don't have physical textbooks for Oklahoma History… the kids just have to log on and access it there. But in how many classes do the kids have textbook access online… and how many of them require different passwords like a capital letter or numbers or something or whatever? I don't have time to have students reset their passwords every time I want them to use, to analyze text from a book...

For Eleanor, this made expectations difficult. She admitted she often wanted to use "cool, new technology" but felt sometimes she would spend more time explaining the technological applications than actually allowing the students to use them. Specifically, she explained:

> It's nice to hear what other teachers are doing, in regards to their, um, their classes… but then I'm thinking about how much time they spend explaining something, and how, um, if we were all on the same page, of like, 'hey we're going to use Google classroom' or

> ‘we’re going to use all Apple programs’ how we could then just, um, say ‘do this’ to the kids and that’s all they know, you know? How easy would that, um, be for all of us?

While Lucy seemed to agree with the “number of different computer things we can do,” she did not appear to be concerned about teaching students about different platforms, noting she thought “we’d teach kids how to use primary documents or historical lessons, so why wouldn’t we teach them… computer things?”

One aspect teachers did seem to agree on was that more direction on the specific desired usages of the devices could be given from district offices or administrative staff, which might help unify teachers on platforms or technology-based educational tools. Marge summed this desire up nicely:

> Sometimes I feel like, you know, if the district wants us to use the computers in our classes, then they should, like, tell us what they want us to use them for. Like, I try to prepare my students for college, where they’ll have to, like, check their e-mail or syllabus or whatever, but what does our administration want? If we’re doing college prep stuff, then, like, I’m good, but I’m guessing we probably don’t want to just, um, treat freshmen like they’re college students.

For John, this was a matter of “school decision makers trying to throw another thing at [our] problem, and the problem is a broken education system - just giving computers won’t fix it.” Lucy took a similar stance, noting she “has been in education for a long time” and “has seen a lot of things the district wants us to do,” adding “technology can be a great tool, but it’s just that: a tool… not a silver bullet or anything.” Apparently, teachers might be willing to use technology insofar as it aids their teaching, but not embrace devices wholesale, without specific instruction to do so from educational stakeholders like district officials or site-based administrators.

Theme Six: When teachers reported successes based on technology as a constructivist tool, it was because they allowed students open-ended creation instead of prescribed evaluation.

I asked the participants to recall a specific instance where they had done something involving student devices and were successful. From the participant responses, the most successful instances involved the students receiving an open-ended task in which they have a relative degree of autonomy in choosing how to demonstrate their learning. For Marge, this meant "allowing my students to create their own Constitution - I received some, um, some good parts that showed the students really did think about what they wanted in, like, their own government." For John, this meant spending a week and a half on "an Oklahoma history unit where students chose something we did not talk about in class… and devising, um, a way for them to teach… to show what they knew about that topic." This required him to teach students how to research, but then give them time to "think - will I [the student] use a boring old PowerPoint, or will I use a poster, or something else?" John indicated students invested in the project and students actually hit on some state standards he had marginalized due to time.

For other teachers, they established guidelines, but allowed students freedom to operate within those guidelines and their own experiences. Lucy described perhaps the richest constructivist experience with her semester ending project:

> The students' last semester project is basically a history of them… we've spent all semester looking at, and studying, our nation's history… but what about their history for them? We have to connect what we teach, what they learn about in class, to them, but what about them, who probably won't… or won't end up in the history books? So we told them this year they have to make a documentary about them… and they can make it

about their lives, but they still have to pick stuff we talked about that… that matters to them; and that's the connection - what is important to them?

From Lucy's example, the constructivism is evident - students bring their own contexts to the learning environment and build their own meaning from their experiences in the class. Eleanor had a similar goal:

> I want students to just, um, just know that history is useful. We just don't have enough history majors. So, for my project, they just… the students take something that they like and then find continuities and changes in that thing over history. It could be more serious issues like the treatment of women or how education has, um, changed… but then I also get topics like… like I had a kid who wanted to see how skateboarding techniques have changed and stayed that same… and that's cool, I guess, because they have to research that information from the past and it… kids don't normally seem to have a lot of curiosity, and so this gets them at that level.

For Freya, she also seemed to want to engage students on their level of interest:

> I'm a gamer. I like playing games. And I think kids do too, so for this project, I just have them think, what would a good game look like for this? And so I tell them "hey, design what you think a video game would look like for this historical event." They don't make the actual game, but they, just, they lay out a plan… a storyboard of sorts, for it. And I get the students who don't… who don't like video games so I tell them to draw the art, or write the script… and how cool would it be if, you know, we could make that some time?

All of the teachers, upon reflection, identified some successes made capable with technology, providing the opportunities for problem solving and historical inquiry to create rich, constructivist experiences.

Discussion

The first question I asked prior to collecting data was "How does a teacher's background with technology influence his or her efficacy in using technology for pedagogical methods?" In light of my findings, Prensky's assertion "digital immigrant instructors… are struggling to teach a population that speaks an entirely new language" seems to be dated and lacking accuracy (2001). From the data, it would seem it is digital natives who are struggling most to teach their fellow digital natives, although it is not because of any difference in technological literacy. Instead, it is more likely to be pedagogical strategies are more important for teachers instructing their children and finding ways to teach them in a constructive manner. Digital immigrant participants, who often had been teaching for longer, more often displayed and reported a larger pedagogical toolbox than the digital natives, who are often more novice teachers. Additionally, the digital immigrants reported to be more likely to be able to see the uses of technology as a constructivist tool, rather than a replacement, for student-centered education.

This apparent dichotomy demonstrates the importance of developing teachers' TPACK. TPACK measures the degree to which teachers are able to know their subject's content, know how to teach content, and know which technologies can support their content delivery (Koehler & Mishra, 2009). In my findings, digital native teachers often understood various technologies afforded to them, but did not know their content and pedagogy well enough to know which technologies they could best leverage to teach their lessons constructively (Hammond & Manfra, 2009). Instead, they reported their knowledge of technology would allow them to enact on-the-spot lessons which included those technologies, but they were often of the replacement variety (for example, recording a video summary instead of writing one for an exit slip). Though this

gave digital native teachers more relief in terms of pedagogical planning, it often meant technology seemed to serve as a time-filler rather than an intentional design decision.

Conversely, while most digital immigrant teachers were more solid in their pedagogical and content knowledge, they frequently acknowledged lacking knowledge of various technological offerings which could support these other aspects of their teaching. This seemed to stem from a lack of time spent both discovering and using different technological tools. For the digital immigrant veteran teacher, planning lessons seemed to consume less time, meaning less of a chance for reflection on incorporation of technology. Instead, it seemed demands of living, or perhaps even comfort with re-teaching already developed and practiced lessons, led to a decreased need to incorporate technology as a constructivist tool on a daily basis.

This led me to more information to help answer my next question, "What successes and frustrations have teachers encountered when trying to use technology to create constructivist lessons?" Of the teachers who participated, all could identify instances where they had experienced new successes in the classroom they could not have without technology. This included, for some, spontaneity of information or internet-only simulations or Web quests that new classroom equity afforded to the teachers. When extensive planning was afforded by the teachers for more open-ended questions in units, the experiences were even richer and more student-centered. This should provide hope to districts by showing that teachers, regardless of experience with technology, are able to design new constructivist experiences for their students who have access to devices through a one-to-one initiative.

The frustrations, however, were also quite pronounced, though this might stem from the fact this is the first year of the devices' implementation in the classroom. Specifically, participants repeatedly discussed they felt students could not responsibly use the technology, and

they had no means of ensuring responsible use of the devices. The internet, it seemed to the participants, afforded great opportunities, but also ample distractions the participants did not seem to indicate they had much control over. These included internet streaming sites like Netflix or pirated copies of video games sent via the school network, or even downloading of virtual private network servers to skirt school firewalls. Participants in particular seemed to feel disappointed no security measures had been taken to insure proper usage of devices. Another factor which seemed to impact teachers' frustrations was they seemed to lack self-efficacy in the different modes of applying the technology to the classroom aside from the few lessons they had received during their limited professional development.

It is important, then, for districts looking to move towards a single-device-per-student implementation process provide professional development to teachers within that district to make sure implementation goes well. Teachers in this district received one day of professional development prior to the beginning of school, and thus felt they only learned the basics of what these computers are capable of. Though enough to provide entry-level instruction on device capabilities, the teachers interviewed did not indicate they acquired the necessary skills from their professional development to effectively implement constructivism within their classes based around the usage of technology (Callahan, Saye, & Brush, 2015). Simply providing the devices is not enough – teachers need to be trained in the various online platforms available to them, and then be given the opportunity to design lessons using the technology. During the school year, the teachers surveyed indicated a lack of time to explore new technologies and learn them, which prevents their implementation on a constructivist level.

In addition to training, it is essential schools using a one-to-one model implement some method of control for the teachers in their classrooms. Problem-based inquiry in history is

essential to creating constructivist lessons enabling students to engage in building of meaning within social studies classes (Brush & Saye, 2008). But students might also have problems focusing when there are so many available distractions on computers, as many of the teachers identified. Without a means of controlling what students can access on their computers, many teachers will find it difficult to develop lessons revolving around student-driven lessons, as they will not have the trust necessary for allowing student agency.

Another aspect important for teachers is access platforms could be more united or simplified. Several of the teachers indicated they were frustrated they might use one platform, but other teachers used different ones, which meant students had different levels of understanding of technology. While signing in through Google accounts helped ease the transition of remembering several different accounts for platforms, teachers felt because there was no direction from administration for which platforms students should use (as an example, all teachers use Google classroom for online learning, all teachers use Piktochart for infographics, etc.), students and teachers had a varying understanding of what they could use computers for constructively. As a result of this, teachers again felt they were losing time trying to explain different platforms to students.

School districts, then, as part of their professional development, should implement a plan that unifies district initiatives, rather than leaving it up to individual teachers. When students enter classrooms in the same district, they would have past experience with the various programs used, which would save teachers time in re-explaining these tools. Additionally, online platforms could do a better job of serving multiple functions, rather than each having an individual landing page and website with its own access, to better support educators. Perhaps the best example of this is the Google suite, which combines Docs, Sheets, and other functions under the same

Google login - while many sites have moved towards allowing Google sign-ins, more platforms doing so could help teachers save time signing students up for these platforms.

My final research question I considered was "To what degree do teachers feel pressured to use one-to-one devices within their classroom, and what support have they been provided that might justify the pressure they feel?" Each of the teachers surveyed indicated there would be pressure on teachers to use the devices to justify the expenditure, although this varied by teacher and the duration of their career. More senior teachers appeared less concerned about any administrative pressure, though they did feel there would be strong encouragement to use the devices. Newer teachers, however, who were concerned with their employment status, did seem to feel they needed to use the technology more within their classroom to impress their supervisors. All teachers participating agreed there was not enough support from the district to justify the pressure.

This also raises the importance of the National Education Technology Plan's and districts' stated vision of increasing student equity through access of devices. It is important for districts to consider the implications of exchanges of large sums of money for the devices, and the message that is sent. While I choose to be optimistic and believe that districts have the best intentions in providing devices for their students to help prepare them all equally for success in an increasingly technology-driven world, simply providing the devices and then providing no additional support could lead to misuse of the devices, defeating the purpose of closing gaps of experience with technology due to socioeconomic factors. The devices themselves are not the cure for educational woes alone. Instead, it is the empowerment of teachers to use the devices to create new experiences that can close educational gaps and help reach students in new ways

previously impossible, which means that districts and individual educational sites have to be very careful in selecting the methods of supporting teachers in a one-to-one setting.

These concerns can be mitigated by districts having intentional discussions about what to communicate to teachers about usage of devices within a one-to-one district. If districts want to require teachers to use the devices to enhance student learning, then they should inform them directly. However, they should also provide supports for the teachers to do so, which may need to take precedence over instructional time - expecting teachers to give up even more of their limited time to learn how to implement devices by themselves might be too idealistic at best, and sinister at worst. On the other hand, if the devices are truly just another tool at teachers' disposal, then that needs to be communicated as well, so new teachers know they will not lose their jobs for not using the devices within their classrooms. This could help reinforce the purpose of technology, as an educative tool, rather than as a singular solution to socioeconomic differences within a district, which might lessen the degree to which digital native, early career teachers use technology as a crutch for solid pedagogical strategies.

One-to-one devices are supposed to bring equity to students within the district, enabling all students to have equal access to technology to help prepare them for an increasingly technologically-based society. While this is a noble goal, simply giving each student a device is not an adequate solution to the problems of inequality. Instead, it needs to be supported by focused professional development, a method of control for teachers, and an understanding teachers use the technology to support their pedagogy, not to replace it. Only then can technology actually serve as a constructivist tool, rather than as a singular solution to system-wide educational woes.

Implications

My discussion of my findings prompts me to suggest implications based on my research. I have identified these implications in three areas: district-level, social studies classrooms, and my own teaching.

Districts looking to implement one-to-one devices

For school districts wanting to use individual student devices within the classroom to improve student learning outcomes and retention, it is important to remember the role a teacher plays in the effectiveness of the plan. Students might have a rudimentary understanding of the capabilities of technology, but the more nuanced uses usually escape their day-to-day usage. The teachers, then, have the greatest capability to use technology for constructivist purposes. This requires training the teachers however.

Sustained professional development might be essential – specifically, teachers must be shown the nuances of what their devices are capable. Teachers who are given the devices without training might simply use them to replace what they are doing on paper or other media with technology access (accessing a textbook online instead of physically, or typing up an essay instead of writing one, for example). Continuous information streams on new developing possibilities, as well as refinement training on current usage within the classroom, are both important for developing agency in teachers by enhancing their technological knowledge (while pedagogical and content knowledge can be developed in other ways) and allowing them to employ the devices to greatest effect within their own classroom. It also provides districts with the opportunity to check in with teachers and hear the frustrations they are experiencing with the implementation of the one-to-one policy, which can provide critical opportunities for reflection on the policy's success.

Additionally, teachers need to feel they can use the technology in their classroom without students being distracted by other aspects of the devices. It may be necessary districts provide some sort of firewall or management program allowing teachers to control what their students are accessing within their classroom. Without this, teachers seem to feel a sense of defeat, stemming from already having a lot of students to manage, much less account for what each individual student might be accessing when their back is turned. More research may be needed to discover ways teachers can keep students engaged when they do not have access to classroom device management tools.

A dangerous assumption districts and schools can make is younger teachers (or digital natives) will be more prepared and able to implement devices to enhance the learning of their students within the classroom. Instead, much like novice teachers in general, these teachers may need *more* guidance in implementing the devices, despite their familiarity with the possibilities. Digital native teachers might have some familiarity with technology due to growing up with it, but this does not automatically translate into technological knowledge, which newer teachers need help developing along with their pedagogical and content knowledge.

Lastly, districts should be careful in mandating the usage of technology to justify the investment in a one-to-one device initiative. This is especially relevant as it applies to digital native teachers. In the Midwestern state in which the study was conducted, new teachers had three one-year contracts before receiving their tenured contract after their third year of teaching. This manifested in the digital native teachers noting they felt pressure, even if not explicitly stated, to implement the devices to please administrators. In doing so, these digital native teachers seemed to become dependent on their usage within their classroom, at times hampering their creativity and the possible uses of the technology for constructivist purposes. Instead, if it is

made clear the technology is a tool for support, and not a curricular requirement, novice teachers across all spectrums might feel more secure in only using the technology as tool for constructivism, rather than as a panacea for classroom procedural issues.

One-to-One in the Social Studies Classroom

The social studies classroom can benefit from one-to-one device usage in the classroom, but social studies teachers need to be careful in how they use the technology. Simply moving assignments to an online platform does not help make lessons more meaningful for students. Instead, it might open up the door to trivialize them or facilitate student cheating. Additionally, it can help reduce the importance of historical inquiry to simple searchable answers rather than engaging, thought-provoking experiences.

Using a problem-based historical inquiry model (Brush & Saye, 2008) allows teachers to create experiences leading to empathy, provide context for, and open new experiences for students in the social studies classroom. The devices in a one-to-one classroom give teachers greater access to resources enabling these lessons. My participants responded the devices seemed to enable more spontaneity within their classes – this can serve as jumping off points for more meaningful discussions for students engaging them in an applicable way. Using these spontaneous discussions, rather than shying away from them, can provide the teacher with new horizons previously unavailable in the social studies classroom.

A lack of control of devices, then, should be seen not as a burden or a reason to avoid them, but as an empowering tool. The social studies teacher can then mentor students about proper usage of devices, and how to seek out their own connections during device usage, to prevent misuse. This can also provide opportunities for teachers to discuss with students the importance of constructivism – that is, constructing their own meanings – from their experiences

with the devices. By being forthright with the students surrounding their purposes, and then trusting students will use their devices for this purpose, teachers can shift the responsibility for usage to their students, further engaging them in problem-based inquiry (specifically, how to use devices to further their success in the social studies classroom).

Implications for My Teaching

As a social studies classroom teacher, my observations and interviews with my colleagues provide me with opportunities for reflection on how I have adapted my teaching in the one-to-one environment. I would fit the label of digital native, having been born in 1990 and having my first experience with technology when my parents purchased a Windows 95 computer in 1996. However, I have been formally teaching longer than both of my digital native participants. This should mean I have more pedagogical and content knowledge than my peers, but upon reflection, I have not been using the devices for truly constructivist purposes. This reflection gives me the opportunity to question why.

Eleanor's claim resonates with me there is sometimes "just not enough time." Planning a constructivist experience requires investment from the instructor, which I have not given enough of my time to. Instead, I think I have used the technology more similarly to the digital native teachers, who mostly used it to replace typical classroom functions. I will need to be more intentional in my lesson design so I can use the technology in purposeful, direct manners to enhance the students' learning experience in my classroom, rather than being the singular medium of student of experience.

I also have the opportunity to help my peers out from a professional development standpoint and could help address the timing needs of creating rich, constructivist experiences for my students. For my digital native peers, who may lack pedagogical or content strategies, I

can collaborate with them to help us combine pedagogical strategies I may have more experience with alongside their creativity in on-the-spot lessons (in particular, their flexibility to use technology as an addition to the end of lessons) to help us develop better lessons. For my digital immigrant peers, I might be able to spend time teaching them new technological tools and developments I have more experience with to help them use their pedagogical experience to help build more constructivist lessons. Either way, collaboration seems to be an important factor in creating more constructivist lessons for all students my department and I work with.

As far as the development of my own personal TPACK, I believe the area I have the most "knowledge" of is my content knowledge. At this point in my career, I have taught every social study available at our school multiple times, which has led to me really understand the content of the courses. As I have grown in my teaching career, my pedagogical toolbox has gotten stronger, but I still need to work on creating lessons which provide meaningful experiences for each individual student to become truly constructivist in nature. I also seem to have more technological knowledge than most of my peers, and should therefore have an easier time incorporating this aspect into my lessons. It is just a matter of practice and planning to get to the point where my TPACK can turn me into a more effective educator.

Opportunities for Future Research

My research has left several avenues for future exploration. An immediate follow up would be seeing how social studies teachers were using devices after the first year of implementation. This data could be used comparatively to analyze the changes made by teachers during the school year/summer of reflection. For digital immigrants, the extra exposure to devices might help familiarize them with even more applications to build on their constructivist lessons, enhancing their technological knowledge (Koehler & Mishra, 2009). For digital natives,

an additional year of maturing in their teaching career would provide them with both pedagogical experience and content mastery. These findings can help prove the value of one-to-one initiatives for constructive purposes.

The study could also be generalized to other teachers beyond the social studies. How does a science teacher try to incorporate devices into his or her lessons during the first year of implementation? Alternatively, how do non-core classes, like music or art, use devices for constructivist experiences within their classroom? Exploring these avenues might help districts implementing a one-to-one approach better tailor their professional development lessons to their different curriculum areas.

Another possible option is to study the effects of one-to-one integration in different socioeconomic areas. A rural school, with a rural faculty, might have greater deficits amongst both digital immigrants and native teachers than a suburban environment. Similar differences might exist between a public school and a magnet school aimed specifically at technological development. By expanding the types of environments explored, further nuanced recommendations can be made to districts on their strategies for implementing one-to-one initiatives.

A different follow up study might look at the experience of the children in a one-to-one environment. A teacher's constructivist lesson plan does not always translate into a learning experience for students. Studying the students in a one-to-one classroom between the implementation year and the subsequent years of school could provide more insight into ways teachers can use the devices to engage students. It could also help demonstrate the extent to which technology aids constructivist experiences from a student's point of view.

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