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The Effects of Technology Integration on Academic Performance and Engagement of Third Grade Social Studies Students: A Mixed Methods Study

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THE EFFECTS OF TECHNOLOGY INTEGRATION ON ACADEMIC PERFORMANCE AND ENGAGEMENT OF THIRD GRADE SOCIAL STUDIES STUDENTS: A MIXED METHODS STUDY

by

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ABSTRACT

The purpose of this study was to evaluate the impact of technology integration on third grade social studies students' academic performance and their engagement with the content of map skills at Peony Elementary. The study took place during the Fall of 2022 with 14 third grade social studies students. There is low academic performance and a lack of engagement from elementary students both nationally and locally. This research explored three questions related to the effects of integrating technology on student academic performance and engagement. The first question looks at the impact of integrating technology on third grade students' academic performance in social studies. The second question examines how technology integration affects third grade students' engagement with the social studies content about map skills. The third question looks at third grade social studies students' perceptions about technology integration on the quality of their learning experience. The study incorporated Google Earth, EdPuzzle, Jamboard, and Pear Deck into a third grade social studies class learning about map skills. This action research study collected both quantitative and qualitative data. Quantitative data was collected using student assessments, surveys and exit tickets. Qualitative data was collected using semi-structured interviews and a researcher's journal. The quantitative data was analyzed using a paired samples *t*-test to compare the pre and post Map Skills Assessment as well as the Elementary Student Engagement Survey. The Elementary Student Engagement Survey, the Student Technology Perceptions Survey, and the exit tickets were analyzed using descriptive statistics. The qualitative data was

analyzed using inductive analysis where coding of the data resulted in themes which emerged. Three themes emerged from the data analysis: 1) technology integration impacted behavioral, cognitive, and emotional engagement, 2) benefits and challenges of technology integration, and 3) the qualities of Google Earth and EdPuzzle on their learning. Findings from this study indicated that integrating technology into a third grade social studies class had a positive effect on students' academic performance and engagement. The students improved from the pre to the post assessment and were found to be engaged in their learning. The students had positive perceptions about the integration of technology.

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CHAPTER 1

INTRODUCTION

National Context

According to the National Council for the Social Studies, social studies education is defined as "the integrated study of the social sciences and humanities to promote civic competence" (Bailey & Shaw, 2006, p. 18). The primary purpose of social studies is to help inform students and help them to make decisions to be a good citizen in a culturally diverse, democratic world (Bailey & Shaw, 2006). It is the responsibility of social studies teachers to teach students the values to become responsible citizens that participate in a democracy (Bailey & Shaw, 2006). Students are learning from their teachers to be citizens that are responsible and contribute to society in a positive way.

In 2001, President George W. Bush initiated the No Child Left Behind Act, which focused on improving achievement and results in annual testing in language arts, mathematics, and science for grades three through eight (Vogler & Virtue, 2007). Social studies was left out of the act. Even though social studies testing is not required on a national level, there is required testing in social studies in only twelve states (Vogler & Virtue, 2007), South Carolina being one of them. Since social studies testing is not required nationally, it has led to the decrease in social studies instructional time and an increase in instructional time for the subjects that are being tested: language arts, mathematics, and science (Burroughs, Groce & Webeck, 2005). In 2003, students in

grades three through eight took the first Palmetto Achievement Challenge Test in social studies (Lintner, 2006). Eighty-one percent of all students in grades three through eight were determined by the results of the test to be "non-proficient" in social studies (Lintner, 2006, p. 4). This was more than any other subject area being assessed.

Social studies is becoming devalued; according to Bailey & Shaw (2006) the devaluation of social studies is because standardized tests primarily focus on assessing language arts and math. Therefore, social studies is perceived to be a less-important area of study. It is also suggested by Bailey & Shaw (2006) that another reason that elementary teachers are not focusing enough on the social studies curriculum is because they lack the knowledge of the subject matter. Vogler & Virtue (2007) state another reason behind the devaluation of social studies is the overwhelming amount of content in a typical state social studies curriculum. Teachers are struggling to get beyond the basic facts of the content and get more into the higher level critical thinking, especially due to the limited amount of instruction time allotted to social studies (Lintner, 2006; Vogler & Virtue, 2007).

Another reason for lowered academic performance in social studies may be a lack of student engagement. A lack of student engagement is prevalent in elementary, middle, and high schools across the United States (Conner, 2016). To address this, there have been multiple studies that have examined ways to build student engagement (Alexander, 2014; Carter & Flushman, 2020; Castro & George, 2021; Havik & Westergård, 2020; Heemskerk & Malmberg, 2020). How a student is engaged in their learning can be seen from three perspectives: behavioral engagement, cognitive engagement, and emotional engagement. Alexander (2014) found that cognitive engagement could be seen through

student motivation and time on a task when using technology and concluded that engaged students demonstrated on task behavior, showed interest in their digital assignment, and had higher academic performance. Carter and Flushman (2020) explored emotional engagement and concluded when students are attentive, interested in their learning, and put effort into their learning that they often have higher academic performance. Emotional engagement can be demonstrated by students by responding to the teacher when the class is asked a question, following directions, being prepared for class, and raising their hand to ask or answer questions (Carter & Flushman, 2020). Despite the research having been conducted on student engagement, there are still many schools throughout the country that struggle to engage students (Lee, 2014; Stott, 2016).

Local Context

The school where this research was conducted is Peony Elementary School. A pseudonym has been used for the school name to protect the privacy of the participants. According to the South Carolina Department of Education website (*2019 SC READY Scores - [redacted] Elem*, 2019), Peony Elementary is performing below the County School District average on SCREADY. In 2019, students in South Carolina performed significantly below the national average in math, reading, and writing (National Assessment of Education Progress, 2019). South Carolina students had an average score of 237 in mathematics, three points below the national public average score of 240; and an average score of 259 in reading, thirteen points below the national average score of 262 (National Assessment of Education Progress, 2019). The average math score for third grade in the local County in 2019 was 498.5, while the average math score for Peony Elementary in 2019 was 426.3 (*2019 SC READY Scores* [redacted]

Elem, 2019). The average English Language Arts (ELA) score for third grade in the local County in 2019 was 475.9, while the average ELA score for Peony Elementary in 2019 was 435.3 (*2019 SC READY Scores -* [redacted] *Elem*, 2019).

Specifically, fifth grade students at Peony Elementary performed below the state average on social studies standardized tests (National Assessment of Education Progress, 2019). According to the South Carolina Department of Education (2019), in 2019 students at Peony Elementary in fifth grade have been underperforming in social studies compared to the school district and state. In 2019 in the local County, 20% of fifth graders scored as *Not Meeting Expectations* on the South Carolina Palmetto Assessment of State Standards (SCPASS) test (South Carolina Department of Education, 2019). In 2019, 31% of Peony Elementary students in fifth grade social studies scored *Not Met Expectations* on the SCPASS (South Carolina Department of Education, 2019). Scores are similar to 2018, where 29.1% of fifth grade students at Peony Elementary did not meet expectations on SCPASS and in 2017, where 18.5% of fourth grade students and 26% of fifth grade students at Peony Elementary did not meet expectations on SCPASS (South Carolina Department of Education, 2019).

Peony Elementary School is a Title I school in South Carolina. The purpose of Title I is to provide "all children a significant opportunity to receive a fair, equitable, and high-quality education, and to close educational achievement gaps" (U.S. Department of Education (USDOE), 2017, p. 6). Title I provides financial assistance to schools who have a high percentage of students who come from low-socioeconomic backgrounds, including families who live below the poverty line. In 2020-2021, 561 of the 770 students, or 73% of the students at Peony Elementary were receiving free or reduced

lunch (*School Directory Information*, 2021). These are children who come from households that receive some sort of assistance such as Supplemental Nutrition Assistance (*School Directory Information*, 2021).

There are roughly 145 third grade students at Peony Elementary, with around 18 students in each class. Out of the 848 students at Peony Elementary School, 54% of the students are Black, 25% of the students are White, 15% of the students are Hispanic, and the remaining 6% of students are listed as two or more races or other (*School Directory Information*, 2021). The classrooms are divided relatively equally among race, gender, and academic ability. There were 18 third grade students in my classroom. 56% of the students were Black, 19% of the students were White, 19% of the students were Hispanic, and the remaining 6% of students were reported in school records as listed as two or more races. The classroom had flexible seating where students can choose their seating each day or are directed to certain seats by myself based on how they learn best. In our district we use Google for our learning management system. In my classroom my students used Google docs for writing, and they use Google forms to complete quizzes. I used Google slides for my instruction, and students often use it to complete activities or share their learning through presentations they have made. I used Google classroom to upload websites and activities I want my students to access. Students also accessed various websites to help with their learning, such as Reflex and Freckle for math practice, and RazKids and EPIC for reading. Both my students and I used technology almost daily in the classroom.

I have experienced many problems with student engagement in the six years that I have been teaching at Peony Elementary School. When students do not have good home

lives, are not clothed, or not fed, this can result in a lack of engagement. These issues often go hand in hand with low academic performance. As we cannot control students' home lives, we must focus on implementing tools for improving student engagement to improve the quality of their learning experiences.

Statement of the Problem

Peony Elementary school faces low academic performance as well as low student engagement in the classroom. The school is performing below the standards of other schools in the local school district in English language arts (reading and writing) and math (*Academic Achievement*, 2019). In 2019, only 54.9% of teachers were satisfied with school-home relations (*School Environment*, 2019). Integrating technology into elementary school classrooms has been shown to improve student academic performance in social studies (Turkuresin, 2021). The integration of technology can improve students' academic achievement by maintaining the attention of the learners (Bester & Brand, 2013). Additionally, if students are motivated to learn and to stay engaged then the likelihood of improved academic performance increases. If students enjoy what they are learning and the method via which it is being delivered to them, the intent is that student academic performance will increase as will student engagement in the classroom.

Purpose Statement

The purpose of this study was to evaluate the impact of technology integration on third grade social studies students' academic performance and their engagement with the content at Peony Elementary.

Research Questions

1. What is the impact of technology integration on third grade students' academic performance in social studies?
2. How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third grade social studies classroom?
3. What are third grade social studies students' perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck to learn map skills?

Statement of Research Subjectivities and Positionality

I am a White female and have earned both a bachelor's degree and a master's degree in the field of education. I will serve as a researcher, participant, and facilitator in the study. I live in the area of this study in South Carolina and teach at Peony Elementary, a Title I school where I have taught for the past five years teaching second grade for two years and third grade for three years. I have had the opportunity to implement technology throughout the curriculum, especially during the recent pandemic which forced teachers to instruct students remotely using technology.

I have always loved teaching. I find working with my students every day to help them learn and grow very fulfilling. However, there are days that I struggle and wish I were working with students in a different capacity, outside of the classroom. Engagement issues in the classroom, student academic performance, and the pressures of state testing can be a lot to handle.

A benefit of teaching at a Title 1 school is that we are provided with many resources such as specialists in math, reading, and technology integration who come into our classrooms and school and help improve our teaching in that area. I have often

considered myself technologically adept and try to incorporate technology as much as I can into my classroom. For this reason, I always enjoyed having the technology specialist come into the classroom. My students were always amazed at all the opportunities presented to them, such as coding or virtual reality. This chance to share my passion for technology with my students will be invaluable. Many of my students do not like the traditional subjects that we teach, and this introduces them to other potential career paths. As our school has become one-to-one with technology this year, I have utilized more technological aids. For example, I used Screencastify to record video lessons for my students to watch while they were at home on their own time and Google classroom for students to access lessons and assignments. I loved being able to share my passion for technology with them and show them that even if they do not like school or all the traditional subjects that we teach, there are other career paths that they can take. I have in previous years incorporated technology into my classroom for math and language arts, but not social studies.

I am interested in learning more about my students and how various issues affect them. I want my students to be as successful as possible, in all aspects of school life. Issues that often affect their success are problematic behaviors, low academic performance, disengagement, and lack of parental involvement. I am determined to see if there are solutions to these problems that occur in my school. I will always strive to remain unbiased during the research period. I have been fortunate enough to have been provided with many educational opportunities. This has given me the belief that education is important and a significant part of my life. Education is a gateway to opportunities and the quality of education one receives contributes to the number of

opportunities available to them. Education is something that everyone has a right to, and no one can take away the knowledge that you gain from education.

A research paradigm is the view that the researcher has about ontology, epistemology, and methodology (Haigh & Withell, 2020). Ontology is "the nature of reality and what they can know about it;" epistemology is the influence that the researchers existing ideas and beliefs have on "what they want to know, how they try to get to know, and criteria they use to make judgments about knowledge;" and methodology is the "appropriate strategies for developing and evaluating knowledge" (Haigh & Withell, 2020, p. 17). My research paradigm is the pragmatic paradigm, and I used a mixed methods approach for my study (Prieto, Asensio-Pérez, & Dimitriadis, 2014). The pragmatic paradigm acknowledges the various setting constraints that must be considered during the evaluation, such as the curriculum, time restrictions, and available resources (Prieto et al., 2014). The mixed methods approach consisted of both quantitative and qualitative data. The mixed methods approach "has come to be referred to as the use of two or more methods in a research project yielding both qualitative and quantitative data" (Geelan, 2015, p. 1). I incorporated quantitative data by measuring student engagement from student surveys and from student academic performance on the Map Skills pre- and post-assessment and exit tickets. I incorporated qualitative data by analyzing student engagement via the semi-structured interviews and the researcher's journal.

I hope that my research shows that integrating technology into the third-grade social studies curriculum will have a positive effect on academic performance and

engagement of my students. I want my students to be as successful as possible and not suffer from a lack of opportunities.

Definition of Terms

Academic Performance is the extent to which the students have mastered specific standards within the social studies unit. Academic performance was measured by comparing the pre-test and post-test data of students' test scores. I looked at the individual standards as well as the test scores to determine mastery within the social studies unit.

Engagement is the effort or energy that the students show toward their learning in the social studies unit. Engagement was measured using two surveys to determine student perceptions of technology integration, as well as the semi-structured interviews and the researcher's journal.

Behavioral Engagement is the actions exhibited from the students such as participation in learning, positive behavior, being on-task, paying attention, asking questions, and participating in class discussions (Havik & Westergård, 2020). The researcher journal contained notes on students' behavioral engagement.

Cognitive Engagement is the way that students learn and the strategies that work best for them. Students want their teachers to understand how they learn and use that to guide instruction (Taylor & Parsons, 2011). The various technologies provided strategies to help with student learning and ultimately guide future instruction. I was also able to use the Map Skills Assessment data to help determine student cognitive data throughout the unit.

Emotional Engagement is the feelings either positive or negative that students have toward their school, learning, teachers, classmates. This can affect student academic performance as well as attendance (Havik & Westergård, 2020). The student survey and exit ticket data revealed students' feelings toward their learning.

Interactive Notebook is the language used at Peony Elementary to describe the physical composition notebook where students glued in paper and pencil notes or activities for social studies. Students then referred to their notebooks to help with their learning or recalling information covered.

Technology Integration is the use of technology to support instructional methods, and in the student learning process, specifically during the student independent activity portion of the lesson. Students used four types of technology that were integrated into the social studies curriculum to demonstrate what they had learned.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study was to understand the impact of technology integration on third grade social studies students' academic performance and their engagement with the content at Peony Elementary. The review of related literature focused on the research questions: 1) What is the impact of technology integration on third grade students' academic performance in social studies? 2) How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third grade social studies classroom? 3) What are third grade social studies students' perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck to learn map skills?

The keywords used for the literature search included technology integration, implement technology, integrate technology, K-12, elementary, academic, academic performance, academic achievement, student perceptions, student perspectives, student attitudes, student engagement, and engagement. The electronic databases used for this literature search were Education Source, ERIC, and Google Scholar. An attempt was made to include recent literature.

This literature review focused on four sections: (a) technology integration, (b) academic performance, (c) engagement, and (e) theoretical framework. The goal of this literature review was to show the effect of technology integration in the third grade social studies curriculum on map skills on academic performance and student engagement.

Technology Integration

Technology integration utilizes digital learning tools for presenting academic material, which differs from the traditional paper and pencil style learning tool that most educators are accustomed to using. The following section will address (a) definition and characteristics of technology, (b) the impact of technology integration in K-5 education, (c) the impact of technology integration in teaching social studies and (d) the students' perceptions of technology integration.

Definition and Characteristics of Technology

Technology integration is defined as the use of technology to support instructional methods, and in the student learning process, specifically during the student independent activity portion of the lesson. This can be done in many ways, whether technology is being added to the instruction portion of the lesson, to the student activity portion, or to both (Liu, Ritzhaupt, Dawson, & Barron, 2017). There are three broad categories of technology integration: technology for instructional preparation, technology for instructional delivery, and technology as a learning tool (Inan & Lowther, 2010). When technology is being used as a learning tool, students are applying what they have been introduced to through the digital tool towards their learning. Technology as a learning tool involves students applying their learning through problem solving, creating products, or sharing their perspectives (Inan & Lowther, 2010). Technology integration is increasingly being used as the world is becoming more digitally centered.

Technology tools that can assist students' learning include word processing, presentations, databases, spreadsheets, and concept mapping (Inan & Lowther, 2010). I will be using four digital platforms, which students can use to assist their learning. The

four tools I used are Google Earth, EdPuzzle, Jamboard, and Pear Deck. Students are more likely to be engaged in their learning when technology is integrated (Alexander, 2014). Nepo (2017) suggests that technology integration can provide immediate feedback to both students and educators. This is helpful since students learn and complete assignments at different paces. Immediate feedback is helpful for educators to monitor their students' learning and make any necessary adjustments to the instruction. There are many forms of technology that provide educators and students with immediate feedback on the students' responses.

The Impact of Technology Integration in K-5 Education

Research on the integration of technology into K-5 classrooms is scant, yet what has been offered identifies a positive impact on students' learning. Technology in the curriculum can provide students with immediate feedback on their learning (Nepo, 2017). Students' critical thinking skills can be improved when integrating technology into learning (Ismajli, Bytqi-Damoni, Shatri, & Ozogul, 2020). It is easy to assess students and allow them to work at their own pace when using technology, especially when there are technology tools that collect data on students' progress and adjust to meet them at their needs (Nepo, 2017). Technology allows students to be innovative and improve on their knowledge and allow people to communicate with others around the world (Porter, 2018). Due to the recent COVID-19 pandemic, technology has been increasingly used by teachers and students, with teachers having to learn new ways of using technology to educate their students. During the pandemic, teachers who had taught for a while but had not had much experience incorporating technology struggled with integrating technology (Huck & Zhang, 2021). A study conducted by Liu et. al (2017) found that teachers were

more likely and felt more comfortable and confident with implementing technology the more years of experience they had with incorporating technology into the classroom.

The Impact of Technology Integration in Social Studies

Social studies is defined by the National Council for Social Studies as "the integrated study of the social sciences and humanities to promote civic competence" (Winter, 2018, p. 178). Social studies has traditionally been taught in a lecture style delivery with a lot of memorizing of people, dates, and places. This does not allow for students to activate higher order thinking skills or explore deeper the inquiry part of learning. As a result, there has been an increasing amount of research into various teaching strategies for social studies at the K-12 level (Bursa & Cengelci Kose, 2020; Çener, Acun, & Demirhan, 2015; Güneş, Arikan, & Çetin, 2020; Ilhan & Oruç, 2016; Turkuresin, 2021). A study conducted by Bursa and Cengelci Kose (2020) found that the use of technology in the classroom, specifically the flipped classroom approach, increased the academic achievement of fifth grade social studies students. Günes et al. (2020) found that there was an increase in academic achievement when Geographic Information System, which gives information about a geographic location, was implemented in fifth grade social studies classes. A study conducted by Turkuresin (2021) examined the implementation of Geographic Information System on students' academic performance ranging from fifth to eleventh grade and found that the Geographic Information System had a positive effect on student academic achievement. Although lagging, integrating technology is one pedagogy strategy being researched and is the focus of this study in a third grade social studies classroom.

There has been a recent increase in the implementation of various teaching strategies, particularly technology, in social studies classes. Ilhan and Oruç (2016) implemented various technology such as PowerPoint presentations and audio-music records and found that there was no significant difference in academic performance between the group that received instruction through technology versus the group who did not. However, since the results still showed to benefit the control group that received the technology, they suggested that technology integration increasingly be used in social studies classrooms to help students grasp the content more easily. Çener et al. (2015) claimed that since social studies is about real life and the world around them, those real-life experiences should be brought into the learning environment. In an increasing digital world, technology can help bring real life issues into the classroom. Çener et al. found that technology integration had a positive effect on student achievement in the social studies classroom. Not only is technology being increasingly integrated into social studies classes, but research outcomes are revealing there can be a positive effect on students' academic performance.

Students' Perceptions of Technology Integration

In a growing technology world, educators are finding ways to change how they teach by incorporating technology. Many times a teacher's choice of technology can affect students' perceptions of technology (Balkan Kiyici, 2018). A study conducted by González-Gómez, Jeong, Airado Rodríguez, and Cañada-Cañada (2016) found that undergraduate students had positive perceptions of the use of technology through the inverse instruction method also known as the flipped classroom model. The students found the videos to be very useful for learning the content as well as engaging them. The

students also thought that the flipped classroom model to be student centered and allowed them to work at their own pace (González-Gómez et al., 2016). A study conducted by Truitt and Ku (2018) discusses third grade students' positive perspectives with the implementation of technology through station rotations. The students shared with the implementation of technology that it provided them more learning opportunities, often assisted them better than their teachers often did, and found the technology tools to be engaging.

Educators are often trying to meet the needs of their students by finding the best ways to instruct their students based on the students' needs. Technology used in classrooms can often be used to help students with learning disabilities due to the accessibility features, such as text to speech, magnification, or auditory output; these can help students in general education classrooms (Nepo, 2017). A study conducted by Kaur, Koval, and Chaney (2017) found that the use of iPads in instruction improved the math performance of elementary students. The gamification of math apps encouraged and motivated the students to continuously practice, and therefore, improve on their problem solving. The direct feedback helped the young students see when their answers were correct or incorrect and therefore understand how to correctly answer the next time (Kaur et al., 2017). The use of iPads also helped students with different learning styles, the ability to use headphones helped auditory learners and the touchscreen helped students who are kinesthetic learners by being able to move things around. In addition to teachers incorporating technology into their pedagogy, educators should also know what their students' perceptions are on the use of technology in the classroom.

Hoffman and Ramirez (2018) conducted a quantitative study with high school history students to examine the students' attitudes on the teacher's use of technology in the classroom. The results showed that the students thought that their teacher's use of technology such as apps like Plickers or Quizlet in the classroom was important for their academic performance and for their lives, such as students being better able to work in groups.

Academic Performance

An important aspect of the education system is students' academic performance and ultimately the growth or improvement of student academic performance. The integration of technology as learning strategies can positively affect student academic performance (Ilhan & Oruç, 2016; Kaur et al., 2017; Luo, Yang, Xue, & Zuo, 2019). The following section will address (a) academic performance in social studies and (b) the impact of technology integration on academic performance.

Academic Performance in Social Studies

There is no doubt that every educator wants to improve academic performance in their students, no matter the subject. Academic achievement is defined as students' proficiency levels with respect to the objectives in the curriculum (Öztekin, 2012). As discussed previously, technology integration can have a positive impact in the social studies classroom. An experimental study conducted by Çiftçi (2020) compared 7th grade students' pre and post assessment data, where one group of students received face to face instruction, while the other group participated in blended learning. The data showed that both groups' academic scores improved from the pre to the post assessment; however, the students who participated in the blended learning group had higher post assessment

scores. The digital platforms of blended learning were thought to have helped improve student academic performance (Çiftçi, 2020). A study conducted by Güneş et al. (2020) found that the use of technology, specifically the Geographic Information System (GIS), improved 5th grade students' academic performance on exams and tests due to the students enjoying the technology activities that were incorporated into the learning. A study conducted by Didin and Kasapoglu (2021) examined the learning strategies of 7th grade social studies students, their academic achievement in social studies, and the relationship between these two variables. The study found that the technology-based learning strategies utilized helped improve students' academic performance and supported students in having high self-expectations, staying on task, setting achievement goals, being more motivated, and having improved time management skills (Didin & Kasapoglu, 2021). The literature supports how the integration of technology in the instruction can improve student academic performance.

Impact of Technology Integration on Academic Performance

There is always a desire from educators to find ways to improve student academic performance. With an increasingly digital world, technology is being integrated in academic curriculum more and more (Ilhan & Oruç, 2016; Kaur et al., 2017; Luo et al., 2019; Nepo, 2017). Çener et al. (2015) conducted a study where the researchers looked at the effects of technology on students' academic achievement in sixth grade social studies. An achievement test, an attitude measurement scale on academic performance, and an attitude scale on Information and Communication Technologies (ICT) was implemented. Çener et al. found that technology integration using multimedia CD, documentaries, and PowerPoint had a positive effect on student performance in the social studies classroom.

While technology integration is not necessarily easy for every educator to implement, the research suggests that it can improve academic performance. Bursa and Cengelci Kose (2020) examined the effects of technology integration through a flipped classroom approach on fifth grade social studies students' academic performance. This mixed method study incorporated pre- and post-test data, a responsibility scale, structured observations, and semi-structured interviews. Bursa and Cengelci Kose found that the flipped classroom approach increased academic performance of the students in the social studies classroom. The literature suggests that some form of technology integration has a positive effect on increasing student academic performance (Ismajli et al., 2020); however, there is a dearth of literature on technology integration in the social studies classroom specifically.

Engagement

Student engagement is a large part of the classroom environment and can affect everything that is done in the classroom. A lack of engagement can have a negative impact on the classroom environment as well as the teacher and students in the classroom (Ahmed, Paschke, Milne, & Barr, 2019; Conner, 2016; Stott, 2016). The following section will address (a) the definition of engagement, (b) types of engagement, (c) impact of student engagement on academic performance, (d) strategies for improving engagement, and (e) engagement when using technology.

Definition of Engagement

Student engagement can be defined as “energy in action” (Appleton, Christenson, Kim, & Reschly, 2006, p. 428). When students are engaged, they are more likely to pay attention in class and participate in classroom discussions (Havik & Westergård, 2020;

Husni, Jumaat, & Tasir, 2022). This can also lead to an increase in motivation to learn, which can lead to improved academic performance. Classrooms where a lot of the students are actively engaged have more energy, and therefore the students give more energy to their peers, to their teacher, and to what they are learning.

Types of Engagement

There are multiple perspectives for examining student engagement. Perspectives that center around what students can be engaged in include academic, cognitive, intellectual, emotional, behavioral, social, and psychological engagement (Taylor & Parsons, 2011). The most common forms of student engagement, with elementary school-aged students, are behavioral, emotional, and cognitive (Conner, 2016; Parsons, S. A., Malloy, Parsons, Peters-Burton, & Burrowbridge, 2018). Behavioral engagement could consist of time on task, participation in learning tasks and classroom discussions and paying attention; cognitive engagement could consist of students' learning strategies, motivation, psychological investment in their learning; and emotional engagement could focus on students' feelings, attitudes, or interest in what is being taught. There are many pedagogical strategies that can be employed to improve each form of engagement with elementary students (Green, 2016; Husni et al., 2022). The writing that follows will elaborate on (a) behavioral engagement, (b) cognitive engagement, (c) emotional engagement, and (d) strategies for improving engagement.

Behavioral engagement. Behavioral engagement is the actions exhibited from the students such as participation in learning, positive behavior, being on-task, paying attention, asking questions, and participating in class discussions (Havik & Westergård, 2020). Behavioral engagement is defined as the "conduct in class, participation in school

related activities, and interest in academic tasks" (Hulsey, Moten, Hebda, Sulak, & Bagby, 2023). Parsons et al. (2018) defines behavioral engagement as "the degree to which students are observably attending to and participating in instructional activities" (p. 234). Conner (2016) defines behavioral engagement as having three categories of school participation: positive conduct, involvement in learning, and participation in the learning environment. Positive conduct can include obeying school rules and attending class regularly. Involvement in learning includes putting forth best efforts, persistence, attention, class participation, asking questions, and participating in discussions with the teacher and other students. Participation in the learning environment can include clubs, sports, or school governance. Participation can also take place in academic, social, or extracurricular activities (Tang & Hew, 2022). Parsons et al. (2018) found that students were more behaviorally engaged in open tasks that were student centered and where more collaboration between students took place. Of the three forms of engagement, behavioral engagement can be observed overtly and can give researchers insight into the student's learning experience.

Cognitive engagement. Cognitive engagement is the way that students learn and the strategies that work best for them. Parsons et al. (2018) defines cognitive engagement as the extent to which students make connections or use strategies within instructional activities. Fredricks, Blumenfeld, and Paris (2004) define cognitive engagement as the level of psychological investment in the learning process exhibited by the learner. Cognitive engagement is conceptualized in the learning and instruction literature as the psychological investment students make towards learning – which ranges from memorization to the use of self-regulatory strategies to facilitate deep understanding

(Barlow, 2019). Pintrich (2015) also provided insight into student cognitive engagement, as defined in terms of motivation. Greene (2015) found deep cognitive engagement to be linked directly to achievement. To increase cognitive engagement, students must move from shallow cognitive processing to meaningful cognitive processing (Walker, Greene, & Mansell, 2006). Deep cognitive processing allows for the kind of mental connection and knowledge elaboration that fosters higher level cognitive learning outcomes, while shallow processing perpetuates rote learning most engendered by lack of robust engagement with the learning materials (Walker et al., 2006).

Students want their teachers to understand how they learn and use that knowledge to guide their instruction (Taylor & Parsons, 2011). Differentiated instruction is an increasingly used strategy for educators (Altemueller & Lindquist, 2017; Courtney, 2021; Lavania & Nor, 2020; Smale-Jacobse, Meijer, Helms-Lorenz, & Maulana, 2019; Winter, 2018) and knowing how each student learns best can help the teacher best meet the needs of that student. Irrespective of pedagogical strategies, research shows that meaningful learning is predicated on quality cognitive engagement (Guthrie et al., 2004; Smith, Sheppard, Johnson, D. W. & Johnson, 2005). Yet, cognitive engagement has historically remained the most difficult component of engagement to define (Sinatra, Heddy, & Lombardi, 2015). Cognitive engagement involves unobservable, latent constructs that cannot be directly measured, and require more intentional approaches that focus on the measurement of related variables to be captured including psychological investment and strategic learning (Fredericks et al., 2004; Hsueh, Daramsenge, & Lai, 2022; McCoach, Gable, & Madura, 2013).

Emotional engagement. Emotional engagement is the feelings - either positive or negative - that students have toward their school, their learning, teachers, and their classmates. A study conducted by Tang and Hew (2022) defines emotional engagement as students' reactions towards their interactions with their teacher, peers, and the learning environment. Heemskerk and Malberg (2020) define emotional engagement as how much students like the subject that they are learning. Parsons et al. (2018) defines emotional engagement as affective engagement which includes student interest, enjoyment, enthusiasm, and efficacy in their learning. Egiebor and Foster (2019) claim that emotional engagement allows students to invest in their learning and can lead to positive academic outcomes.

Students' emotional engagement can affect their academic performance as well as their attendance (Havik & Westergård, 2020). Zee & Koomen (2020) conducted a study that examined the role of classroom factors on students' emotional engagement using teacher observations and student self-reports for their data collection sources. The study found that students showed higher levels of emotional engagement when their teachers had high self-efficacy toward them, showed autonomy-supportive behaviors, and maintained close and conflict-free relationships with them. A students' emotional engagement can also be influenced by external factors outside of the school and classroom, such as family beliefs and values as well as the student's home environment and living situation.

Students' learning attitudes are an indication of their behavior in class and towards what they are learning. Learning attitudes are defined by Hui, Mai, Qian, and Kwok (2018) as active learning and engaged learning. If students have a negative

learning attitude, then they are going to be passive learners who are not engaged in what they are learning (Hui et al., 2018). Whereas if students have a positive learning attitude, then they will more likely be active learners who are engaged in what they are learning. Students with positive learning attitudes can also develop better self-regulation skills. This can help them manage their motivation and ultimately their behavior (Hui et al., 2018; Lo & Hew, 2017; Sletten, 2017). The more engaged students are in their learning, the more they will improve their learning attitudes and become active participants in their learning. For researchers, emotional engagement is less observable and is recorded most often as the students' reactions to course features (Barlow, 2019).

Impact of Student Engagement on Academic Performance

Student engagement can lead to improved academic performance. When students are engaged, they see school in a positive way. When incorporating technology, both academic performance and student engagement improves (Stratton, Chitiyo, Mathende, & Davis, 2020). Student engagement "predicts enhanced student achievement, retention and graduation from high school, the acquisition of knowledge and skills, and improved emotional functioning" (Havik & Westergård, 2020, p. 489). Student engagement can also lead to increased class participation. When students participate more in class, they are more involved in their learning (Havik & Westergård, 2020; Husni et al., 2022). When students are more engaged in what they are learning, it is easier for teachers to identify what their students do and do not understand and where they might need to adjust instruction. A study conducted by Klem and Connell (2004) showed that middle school students with higher levels of engagement were 75% more likely to have higher academic performance and attend school more regularly than students who had lower

levels of engagement. Castro and George (2021) also found that student engagement was related to learning and academic performance. Many students liked the flexibility that digital learning offered which helped keep them engaged (Castro & George, 2021). This suggests that when students are engaged their academic performance can improve.

Strategies For Improving Engagement

A study conducted by Egiebor and Foster (2019) investigated eighth grade students' perceptions of using geographical information systems Story Maps to learn social studies. The goal of the study was to identify and describe students' perceived engagement using geographical information systems Story Maps. The use of the Story Maps increased student behavioral engagement by increasing student inquiry and encouraging students to create answers to the questions that they had and were being asked. Additionally, the use of Story Maps increased their curiosity and made them active learners. The use of the Story Maps increased student cognitive engagement by allowing students to access a variety of information on the different map layers, which helped them better visualize what they were learning. The use of the Story Maps increased student emotional engagement because they saw the Story Maps as a new innovative technology that allowed students to interact with their learning.

An important part of any classroom environment, as well as the successful implementation of any instructional strategy is classroom management. Changing the way students apply their learning can result in a positive change in student engagement (Husni et al., 2022). Positive communication between the teacher and student can encourage a successful relationship. It is important for teachers to respond positively towards the student exhibiting a negative behavior as this can lead to improved behavior

from students (Liontou, 2019; Owens et al., 2018; Powell, Parker, Harpin, & Mawson, 2019). Owens et al. (2018) states that praise could be beneficial to creating positive teacher-student relationships, as well as on-task behavior from students. If students have a better relationship with their teacher and have supportive and engaging ways to demonstrate their learning, then that can improve student engagement in the classroom.

Teachers providing clear instructions and commands, both verbal and nonverbal, to students can improve student engagement. The instructional commands should be developmentally appropriate, stated positively, articulated in one-to- two steps, be specific, and allow for an appropriate amount of time for the student to complete the instruction (Owens et al., 2018). In conducting research with elementary students, Owens et al. (2018) found when teachers used effective commands combined with praise it resulted in additional improvements in the students' compliance. Therefore, good classroom management starts with clear expectations from the teacher to the students.

Engagement When Using Technology

Engagement often increases when technology is incorporated into student learning. When students are more interested in how they learn, then they become more engaged (Husni et al., 2022). Engagement can be observed as students being attentive, time on task, motivation, and participation in the learning process (Havik & Westergård, 2020; Heemskerk & Malmberg, 2020; Husni et al., 2022; Parsons et al., 2018; Schardt, Miller, & Bedesem, 2019). Alexander (2014) conducted a study that examined student engagement in a sixth grade history class with the integration of technology through use of a digital storyboard tool. To measure student engagement, the study collected data through observations, interviews, and student artifacts. The researcher looked at time on

task, higher order thinking, and creativity. Alexander's findings showed when the digital storyboard was integrated into the curriculum, students demonstrated increased on task behavior and showed greater interest in the use of technology when learning about the Civil War. Based on time-on-task data alone, observations from this study would be highly encouraging to many classroom teachers.

Kaur et al. (2017) found that the use of iPads in an elementary math class improved student engagement and participation. By the end of the data implementation students were very eager to solve math problems (Kaur et al., 2017). Using the apps on the iPads made solving math problems fun for the students and made them more willing to do their work. The immediate feedback of the apps helped students stay focused, on-task, and engaged in what they are doing (Kaur et al., 2017). Therefore, students were motivated to use the iPads and wanted to complete their tasks.

Johns, Troncale, Trucks, Calhoun, and Alvidrez (2017) discussed the benefits of student engagement when implementing various forms of technology including Seesaw, Educreations, Google Classroom, and Classtools.net. Student engagement not only increased student achievement but also encouraged the students to be active learners and to think more deeply about what they are learning (Johns et al., 2017). The existing literature supports how teachers can integrate technology to enhance instruction and promote student learning.

Theoretical Framework

Piaget's learning theory of constructivism focuses on students building their own knowledge centered on their experiences and interactions with the world (Hansen, McBeath, & Harlow, 2018). My study will have students using technology tools that they

have never used before in social studies. Since constructivism focuses on students' experiences and building their own knowledge, the goal will be for the participants to be able to build their knowledge of map skills in social studies using the new technology tools.

Constructivism Learning Theory

Constructivism is the belief that the learner can create meaning from what they are learning (Ertmer & Newby, 2013). Students do not just create meaning from their own individual learning but are also influenced by the social aspects of learning by interacting with peers. Constructivists believe "that knowledge construction by the learner can be formed from both their existing knowledge and their social interaction process with their surrounding environment" (Mohammed & Kinyo, 2020, p. 92). Learners construct their knowledge and makes meaning from their learning in different ways. Students build onto their previous knowledge when they are learning and obtaining new knowledge "through conducting investigations, conversations or activities" (Grant, 2002, p. 1). Students learn in different ways and at different rates, so therefore will make meaning from their learning in different ways.

Constructivism and Integrating Technology

Technology is becoming a more widely used tool throughout the instructional design process, not only in the tools educators use to teach, but also in activities in which students partake. Technological advances "facilitate ease of access to quality, structured learning in accordance with multimedia and constructivist learning approaches wherein multiple tools permit access to comprehensive content with on-demand availability" (Mohammed & Kinyo, 2020, p. 91). Constructivism can also be looked at through a

digital lens. Learners are using technology as a tool to enhance what they are learning. Focusing on online constructivism, "learners construct knowledge based on their cultural experiences, their situations, and their perspectives" (Kumi-Yeboah, Kim, Sallar, & Kiramba, 2020, p. 47). Kumi-Yeboah et. al (2020) concluded that when students are learning online with their peers, it can encourage them to participate and share their knowledge with their peers. The study used digital technologies such as video lectures, voice thread, blogs, wikis, and Google Hangouts; and explored the student perspectives as well as academic experiences and achievements. They found that the learners can use their cultural and educational experiences to create meaning from their learning.

Impact of Constructivism on Academic Performance and Student Engagement

As stated, constructivism focuses on students building their knowledge from their experiences and making meaning from it. The constructivist approach emphasizes students' "active roles in the education process, as well as their capability of developing their own knowledge by themselves based on experience and previous knowledge" (Hus & Jančič, 2019, p. 65). Constructivism encourages students to be active learners. Constructivism combines various teaching strategies and, therefore allows teachers to select from a variety of teaching strategies (Hus & Jančič, 2019). Different teaching strategies that fall under constructivism are experiential learning, research-based learning involving integrated technology, problem-based learning, project-based learning, practical learning, and teamwork (Hus & Jančič, 2019). Within the constructivist paradigm, students learn new knowledge that is affected by their development, their intrinsic motivation, and where they are already cognitively (Rodrigues De Mello, 2012). The integration of technology in learning allows students to become creative in the

learning process (Rodrigues De Mello, 2012). Research has shown that engagement and self-regulated learning can have positive effects on students' academic performance in online learning (Banihashem, Farrokhnia, Badali, & Noroozi, 2022).

Cevikbas and Kaiser (2021) defines engagement, specifically behavioral engagement as requiring effort and participation in social, academic, and extracurricular activities. Cevikbas and Kaiser state that engagement is necessary for achieving positive academic results. It is appropriate for a study that is investigating student engagement to use constructivist theory because it has students assess their knowledge and their opinions of their learning; therefore, students are making meaning of their learning. A study conducted by Banihashem et al. (2022) showed that when technology was integrated through learning analytics, students became active participants in class and became more engaged in the lesson while constructing their knowledge.

Chapter Summary

With technology being increasingly used in education, new learning tools are being designed and invented to meet our changing needs. An increase in technology use within society means that many new teaching methods now incorporate some form of technology. There is an increasing pedagogical belief on the effectiveness of technology integration to improve academic performance and student engagement. Academic performance, specifically in social studies, can be positively impacted by integrating technology. Technology integration can also encourage student engagement, which can be an incentive for many teachers to integrate technology into their classrooms.

CHAPTER 3

METHOD

The purpose of this study was to evaluate the impact of technology integration on third grade social studies students' academic performance and their engagement with the content at Peony Elementary. The following research questions guided the study:

1. What is the impact of technology integration on third grade students' academic performance in social studies?
2. How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third grade social studies classroom?
3. What are third grade social studies students' perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck to learn map skills?

Research Design

Action research is defined as "research that is done by teachers for themselves" (Mertler, 2019, p. 6). Educators want to find a solution to a problem that they are facing (Mertler, 2019). They start by identifying a problem and an area on which they want to focus. Then the educator will collect, analyze, and interpret the data. The data will then be used to create a plan of action. Action research is an appropriate approach because I am an educator looking for answers to issues that I face in my field. The problem I am facing is a low performing class of third grade students who also struggle with a lack of

engagement. I wanted to see the effects on my students' academic performance and engagement if I adjust the way that I deliver content. The goal of action research is to improve aspects of education by adjusting the way that instruction is administered (Mertler, 2019). Action research is not just solving a problem; educators are implementing plans and reflecting on the results. Action research helps teachers learn from what they are doing (Downes, Bishop, Swallow, Olofson, & Hennessey, 2016). They then have direct information on how they can improve their strategies for the future. Action research is a "cyclical process of planning, acting, developing, and reflecting" (Mertler, 2019, p. 18). The cyclical process can be shown through the steps of identifying a problem, designing your action, taking that action, collecting data, analyzing the data, and reflecting on the data (Downes et al., 2016).

A benefit of action research is that it focuses on finding a specific solution to a specific problem, which can also have broader implications. Action research provided me with "opportunities to better understand, and therefore improve" the ways that I teach my students (Mertler, 2019, p. 20). By refining my teaching methods to best suit my students, I hoped to improve their academic performance as well as find ways to have them become more engaged in their learning. In sharing my findings with peers in my field, I gained new ideas and methods from my peers as well.

This study followed a mixed methods approach incorporating both quantitative and qualitative data focusing on the impact of technology integration on third grade social studies students' academic performance and their engagement. Lo (2017) suggested that action research provides a link between the research and the practice that is

implemented. Using both quantitative data and qualitative data provides "a stronger understanding of the problem" (Creswell & Creswell, 2018, p. 213).

Participants and Setting

The study took place at Peony Elementary School with the participants consisting of students from my third grade social studies class. My third grade students ranged in age from eight to nine years old. On average, there were as many boys as girls in my classroom. Children with learning disabilities were included in the study as well as students who received ESOL services. There were 14 third grade students in my classroom that participated in the study. Fifty-seven percent of the students identified as Black, 21% as White, 14% as Hispanic, and the remaining 7% as two or more races. Pseudonyms and gender-neutral pronouns were used to protect the privacy of the participants. Table 3.1 shows the demographics of the participants.

Table 3.1 *Participant Demographics*

Pseudonyms	Age (years)	Ethnicity	Students with learning disabilities or ESOL
Jordan	9	White	No
Cassidy*	8	Black	No
Kennedy*	9	Black	No
Jo	8	Black	No
Morgan*	8	Hispanic	No
Dylan*	9	Two or more races	No
Charlie*	8	White	Yes
Taylor*	9	Black	Yes
Imogen	8	Black	No
Peyton*	8	White	No
Lane	8	Hispanic	No
Blake	8	Black	Yes
Shawn	9	Black	No
Riley*	9	Black	No

Note. The * identifies the students who took part in semi-structured interviews.

My classroom had flexible seating where students could choose their seating each day based on how they learned best. Google Classroom was the learning management system used at Peony Elementary, and the students were familiar with Google Classroom, Google Docs, Google Forms, and Google Slides functions. The elementary school began incorporating Chromebook devices in the 2017-2018 academic school year. The classrooms were 1:1 with technology, with each student having access to a Chromebook. The Chromebooks were used primarily for math and literacy curriculum, and rarely were they integrated into social studies classes. The students used their Chromebooks for apps/websites such as Google Earth, EdPuzzle, Jamboard, and Pear Deck. They have used these four specific websites for various subjects, not just social studies. Each student was also provided with headphones to use with their Chromebooks. I also had an interactive white board that I used for instructional delivery.

Teachers were required to use technology in the classroom since we are 1:1 with technology; however, there were no specific requirements in how the technology is used. The technology integration of this study was implemented into the social studies independent work time, which occurred every day for about 20-25 minutes, after the 10–15-minute mini-lesson where instruction was administered. The content in social studies was new for the students since the social studies standards did not build on each other every year. The students had very little to no prior knowledge about the content administered in the map skills unit.

Intervention

The technology integration in third grade social studies took place during the fall of 2022. In this study students learned about map skills using four technology tools.

Students demonstrated their learning through their interactions with these four technology tools: Google Earth, EdPuzzle, Jamboard and Pear Deck. This section will explain a) a description of the intervention, b) the technology being integrated and c) a description of each unit of study.

Description of the Intervention

The four units used for this study covers map skills. The students were expected to differentiate between land and water on a map, know the cardinal directions, identify and use a map legend/key, know the different types of maps (i.e. political, physical, topographic, road, resource, and climatic), know the continents and oceans, comprehend how to use an alphanumeric grid, know the hemispheres, know and identify latitude and longitude, know the equator, prime meridian and international date line, understand that maps are drawn with a scale, and know the landforms in our region. The social studies South Carolina standards that were measured during this unit are as follows:

- **3.1.1.AG:** Utilize an alphanumeric grid to locate the continents and oceans.
- **3.1.2.AG:** Locate the world's four hemispheres (i.e., northern, southern, eastern, and western) by using the major components of latitude and longitude (i.e., the Equator, the Prime Meridian, lines of latitude (i.e., parallels), lines of longitude (i.e., meridians), and the International Date Line).
- **3.1.3.PR:** Identify the spatial hierarchy of political and physical geographic features.

Technology Being Integrated

For each unit of the intervention, Google Earth, EdPuzzle, Jamboard, and Pear Deck were integrated into the teaching of the lesson during the student's 20-25 minutes of self-paced, independent work time. While each tool was used each day throughout the intervention, all technology tools were utilized multiple times. The technology tools used were Google Earth, EdPuzzle interactive videos, Jamboard collaborative and independent slides, and Pear Deck slides. Google Earth allowed students to explore the world around them using 3D representations of locations to understand digital maps and map tools (Alajmi & Al-Hadiah, 2017; Britt & Lafontaine, 2009; De Paor, Dordevic, Karabinos. Burgin, Coba, & Whitmeyer, 2017; Patterson, 2007). EdPuzzle had students watch instructional videos and respond to fourth to sixth grade appropriate embedded questions. Jamboard, a Google product, allowed for students to collaborate while using a common space interactive whiteboard in making visible, authentic learning about maps, as well as showing their work independently. Pear Deck slides are inclusive, interactive, and engaging, and were used to evaluate students' learning through a variety and grade-friendly presentation of questions (Minkkinen, 2022). Each tool was chosen to provide a variety of learning opportunities to students for their different learning styles, for example having videos on EdPuzzle for students who were auditory learners. Students were also provided with different ways to show their learning; for example, the multiple choice questions throughout the EdPuzzle videos, and the different variety of questions on Pear Deck including dragging and multiple choice. Another example is how Google Earth allowed the students to explore and investigate the world around them, and Jamboard also provided different ways for students to show their learning through

multiple choice response as well as short answer response. This gave students the opportunity to show their learning to portray their understanding of the content taught. The goal of having a variety of technology tools was to keep students interested in the content they were learning. This was furthered by constructivism theory, which focuses on students being active learners in the learning process and having an intrinsic motivation in their learning (Hus & Jančič, 2019). Students taking an interest in their learning with different teaching and learning strategies makes them active learners.

Description of the Units of Study

Unit 1: Identify and use the features of a map. Unit 1 began with introducing maps and learning how to identify the features that are on a map including a compass rose, the cardinal directions, and a map key/legend. Students had to identify the different types of maps (i.e. political, physical, topographic, road, resource, and climatic). Students used Google Earth as both physical and political maps, finding landforms, as well as various locations. An example of a Jamboard prompt for students was "What does a climatic map show, and why would we use one?" and "How can I figure out what the symbols on a map mean?" Students shared their responses and were able to see their classmates' responses. A Pear Deck slide activity had students interacting and identifying various locations on maps using the map key and compass rose. An EdPuzzle interactive video explained features found on a map and prompted students to identify and explain the features on a map, such as the cardinal directions and the map key/legend. This unit of the intervention lasted seven days.

Unit 2: Using an alphanumeric grid to locate continents and oceans. The second unit of this intervention focused on knowing the continents and oceans and being

able to identify them on an alphanumeric grid. An example of a Jamboard prompt for students was “What is an alphanumeric grid, and why do we use it?” and “List all of the continents and oceans.” The students used Google Earth to practice locating and identifying the continents and oceans. An example of an EdPuzzle interactive video allowed students to answer questions about how to use an alphanumeric grid and to practice identifying continents and oceans on an alphanumeric grid. The Pear Deck activity involved students using an alphanumeric grid to locate continents and oceans, as well as being given a continent or ocean and having to identify the alphanumeric grid in which it was located. This unit of the intervention lasted seven days.

Unit 3: Using latitude and longitude to divide the world into hemispheres. In Unit 3 students identified longitude, latitude, the equator, the prime meridian, and the hemispheres on a map. Students used Google Earth to locate various degrees of latitude and longitude as well as the equator, the prime meridian, and the hemispheres. An example of a Jamboard prompt for students was “Which direction do latitude lines run in?” and “What two hemispheres does the equator divide?” An example of a Pear Deck activity involved students drawing lines of latitude and longitude, the equator, and the prime meridian on a map of the world. The students also identified and wrote the hemispheres on a map of the world. An EdPuzzle video explained the lines of longitude and latitude, the purposes of these lines, the equator, and prime meridian. The EdPuzzle video also explained the hemispheres and their purposes. An example EdPuzzle question asked students, “What two hemispheres does the prime meridian divide?” and “Which direction do longitude lines run?” This unit of the intervention lasted three days.

Unit 4: Using spatial hierarchies to draw conclusions from political and physical maps. The fourth and final unit of this intervention focused on local landforms such as mountains, hills, plains, rivers, streams, lakes, and forests. Students identified where we live: city, state, country, and continent. Students used Google Earth to locate the local landforms as well as the city, state, country, and continent in which we live. The students completed a Pear Deck slides activity where they used Google Earth to identify the city, state, country, and continent we live in, and to locate and record the landforms that are local to us. This unit of the intervention lasted one day.

Table 3.2 is the map skills teaching plan that shows how technology integration was used in Unit 2. See Appendix A for the map skills teaching plans for all four units of this study's intervention.

Table 3.2 *Sample Teaching Plan Showing How Technology Integration is Used*

Day	Lesson	Unit of Study	Standards
Day 9	**I can statement:** I can identify the continents and oceans. **Activating Strategy:** Give students a blank world map and see how many continents and oceans they can label. **Teaching Strategy:** Teach the continents and oceans song using the PowerPoint page 3-15. The class will watch the continent's video. Students will complete the backpack around the world activity as they travel to each continent and ocean. **Summarizing Activity:** The students will use Google Earth to locate the various continents and oceans. The students will also play Guess the Continent and Ocean. The students will also complete an exit ticket about the use of Google Earth.	Unit 2	3.1.1.AG
Day 10	**I can statement:** I can identify the continents. **Activating Strategy:** The class will review what they have learned about continents and oceans.	Unit 2	3.1.1.AG

	Teaching Strategy: The teacher will use the google slides to review continents. The students will complete the notes while the teacher is going through the slides page 36. **Summarizing Activity:** The students will use Pear Deck and match the continents on the map. The students will also complete an exit ticket about the use of Pear Deck.		
Day 11	**I can statement:** I can identify continents and oceans. **Activating Strategy:** The class will review what they have learned about continents and oceans. **Teaching Strategy:** The teacher will use the google slides to review continents. The students will complete the notes while the teacher is going through the slides page 42. **Summarizing Activity:** The students will use Pear Deck and match the continents and oceans on the map. The students will also complete an exit ticket about the use of Pear Deck.	Unit 2	3.1.1.AG
Day 12	**I can statement:** I can identify continents and oceans. **Activating Strategy:** The students will play the continents and oceans game to review for their quiz. **Teaching Strategy:** The teacher will review any misconceptions from the game page 16-18. If there is time the class can also play the Kahoot (or this can be done instead of the game). Review the continents and oceans with the Kahoot game. **Summarizing Activity:** The students will complete the quiz.	Unit 2	3.1.1.AG
Day 13	**I can statement:** I can use an alphanumeric grid. **Activating Strategy:** The class will watch a video about using alphanumeric grids using EdPuzzle. **Teaching Strategy:** The teacher will use the google slides to teach about alphanumeric grids. The students will complete the notes at the same time page 31. **Summarizing Activity:** The students will follow the directions to create an alphanumeric grid page 32. The students will answer the questions found within EdPuzzle. Complete the interactive notebook task on page 34. The students will also complete an exit ticket about the use of EdPuzzle.	Unit 2	3.1.1.AG

Day 14	**I can statement:** I can use an alphanumeric grid. **Activating Strategy:** Grid Puzzle (The students will assemble grids with a partner and then ask each other questions.) **Teaching Strategy:** The teacher will use the PowerPoint pages 46-55 review and model how to read an alphanumeric grid. Students will rotate to alphanumeric grid stations to practice reading different grids. **Summarizing Activity:** The students will be given a Jamboard question where they will have to explain how to use an alphanumeric grid and they will have to identify locations using the alphanumeric grid. The students will also complete an exit ticket about the use of Jamboard.	Unit 2	3.1.1.AG
Day 15	**I can statement:** I can use an alphanumeric grid. **Activating Strategy:** The class will review how to read alphanumeric grids. **Teaching Strategy:** The teacher will clarify any questions/confusion. **Summarizing Activity:** The class will complete the alphanumeric quiz for a minor grade. The students will also complete the exit ticket about the use of Jamboard.	Unit 2	3.1.1.AG

Data Collection Methods

To answer the proposed research questions, various data collection methods were used. This research utilized a mixed methods evaluation design consisting of both quantitative and qualitative data collection (Creswell & Creswell, 2018). Academic data was collected through assessments, specifically pre- and post- Map Skills assessment data of the social studies unit to see the impact of technology integration on growth in the students' social studies academic performance. Additional quantitative data was collected in the form of two engagement surveys and exit tickets. Qualitative data was collected in the form of the semi-structured interviews with the students and the researcher journal. The researcher journal was anecdotal on observations of students' behaviors as well as emotional

engagement indicators during the technology integration time. Additionally, the researcher journal collected my own reflective thoughts on the research process. The student interviews were focused on the third grade students' attitudes and perceptions about the implementation of technology integration on their learning experiences. Table 3.3 shows the alignment of the research questions, and the data collection sources.

Table 3.3 *Research Questions and Data Collection Sources*

Research Question	Data Collection Sources
RQ1: What is the impact of technology integration on third grade students' academic performance in social studies?	• Map Skills Assessment (pre and post-test)
RQ2: How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third grade social studies classroom?	• Elementary Student Engagement Survey (pre-post) • Student Technology Perceptions Survey • Researcher's Journal
RQ3: What are third grade social studies students' perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck to learn map skills?	• Exit Tickets • Student Technology Perceptions Survey • Semi-Structured Interviews

Quantitative Data Sources

There is prevalent use of quantitative research throughout multiple educational technology journal articles (Hochbein & Smeaton, 2018). Quantitative research focuses on collecting and analyzing data that is shown numerically (Goertzen, 2017, Mertler, 2019). Quantitative research answers the "what" and "how" questions and identifies trends across the data but does not always reveal the "why" (Goertzen, 2017). Quantitative data can be "measured and quantified, it can be evaluated using statistical analysis, and results can be summarized, compared, or generalized" (Goertzen, 2017, p. 13). An advantage of quantitative data is that the findings can be generalized and are

representative of the population (Goertzen, 2017). Another advantage of using quantitative data is that since the data is numerical, it can be shared and replicated for future studies.

Quantitative data sources were used to measure students' academic performance as well as student perceptions of technology integration. Assessments allow educators to "evaluate student learning and utilize information in order to improve learning and instruction" (Unal & Unal, 2019, p. 4). Summative assessments (as offered in the post-test) were used to get a broader understanding of student achievement and are typically administered at the end of an instructional unit (Mertler, 2019). Additional assessments used in this study consisted of exit tickets incorporated throughout the unit. The quantitative outcomes gave me an insight into the impact of implementing technology integration into the map skills curriculum on students' academic performance.

Student assessments. Assessments are implemented to help teachers identify student strengths and weaknesses and how much they have learned and use this feedback to improve teaching and learning (Unal & Unal, 2019). Pre and post-tests are often used to measure student growth from the beginning to the end of what they are learning. Students often perform better on the post-test compared to the pre-test (Azi & Gündüz, 2020; Gürgil, 2018; Mcallister, 2016). A study conducted by Sel and Sözer (2021) showed that there was a significant difference between the fourth grade social studies students' pre-test achievement scores and the post-test achievement scores with students performing better on the post-test compared to the pre-test.

Map skills assessment (pre and post-test). In this study, the social studies unit pre-test was the same as the post-test. I began my intervention by administering on the

first day a Map Skills pre-assessment (Appendix B) for social studies. The assessment was specific to the social studies unit and measured these third grade South Carolina social studies standards:

- **3.1.1.AG:** Utilize an alphanumeric grid to locate the continents and oceans.
- **3.1.2.AG:** Locate the world's four hemispheres (i.e., northern, southern, eastern, and western) by using the major components of latitude and longitude (i.e., the Equator, the Prime Meridian, lines of latitude (i.e., parallels), lines of longitude (i.e., meridians), and the International Date Line).
- **3.1.3.PR:** Identify the spatial hierarchy of political and physical geographic features.

The data from this pre-test assessment was used to both help me determine what we will need to work on throughout the unit as well as compare the pre-test assessment to the post-test assessment. The comparisons of the pre-test and post-test student assessment scores showed areas of knowledge growth for students both individually and collectively. This was used to show if student academic performance was affected by the integration of the technology tools.

Two other third grade teachers at Peony Elementary School collaborated with me to create the Map Skills Assessment instrument. Mentz and de Beer (2021) stated that one's "peers can act as resources for learning and provide assistance in planning, implementing and evaluation of learning" (p. 169). These peer educators helped make sure that the pre- and post-test was aligned to each section of content being covered and

made sure that the assessment was aligned to the SC standards. Both the pre and post-test map skills assessment were worth a total of 30 points. The test had a total of 27 questions worth a total of 30 points, with 15 questions assessing standard 3.1.1.AG, 5 questions assessing standard 3.1.2.AG, and 7 questions assessing standard 3.1.3.PR. Questions 1 – 26 were a combination of multiple choice and short answer questions, each worth one point. Question 27 was labeling cardinal directions and was worth four points. The raw scores from the Map Skills pre- and post- assessments were used for data analysis.

Exit tickets. Exit tickets throughout the unit were used to measure and monitor student perceptions on the use of each technology tool. An exit ticket is a "short response [task]s that teachers administer to students after an activity or class period" (Maxlow & Sanzo, 2018, p. 19). Exit tickets should have questions or statements to prompt students and should not take more than five minutes to complete (Maxlow & Sanzo, 2018). The act of turning in an exit ticket allows for a private platform for students who do not like to publicly share in front of their peers to share their learning and perspectives (Maxlow & Sanzo, 2018). This gave the students ownership of their learning. Additionally, exit tickets describe the collective level of performance of student learning, as well as their collective perspectives regarding technology integration into their class activities (Green, 2016). The exit tickets asked the students about their perceptions of the technology tool used each day. This gave me an idea of students' perceptions on technology and the individual technology tools throughout the intervention.

I created the exit ticket questions to determine the students' perceptions on the integration of technology on their learning. The exit tickets showed each student's perceptions on the technology tools and compared across all the students. Students'

perceptions could change depending on the activity with the technology tool; therefore, having an exit ticket each time a technology tool was used allowed for a range of responses. Students were asked to respond to questions using face emoticons. The exit ticket questions were the same each day and focused on the technology being used that day. The responses that used face emoticons were transferred into a 3-point Likert scale with 1 = disagree (sad face), 2 = no opinion/neutral (neutral face), and 3 = agree (smile face). For example, during the lesson on day 10, Pear Deck was used to match the continents on the map. The exit ticket for day 10 was "I enjoyed using Pear Deck today" where the student chose the emoticon that best fits their response. Exit tickets were given to students as a Google form at the end of each social studies lesson. See Appendix A for how the exit ticket was used each day throughout the intervention.

Surveys. A survey is "an investigation of the opinions or experiences of a group of people based on a series of questions" (Nayak & Narayan, 2019, p. 31). Surveys can also be used as a form of member checking (Alarcón, Marhatta, & Iluore, 2022). Survey questions used are predetermined and are geared towards obtaining data from a specific group of people (Nayak & Narayan, 2019). Both surveys in this study were administered to the students through Google forms at the end of the data collection phase. The survey questions focused on the students' attitudes and perceptions towards their experience with technology integration.

Elementary Student Engagement Survey. The Elementary Student Engagement Survey (Appendix C) was created by the Communities in Schools and the American Institutes for Research to help "understand and measure student, family and educator engagement in learning" (Communities in Schools & American Institutes for Research,

2020, para. 1). The Elementary Student Engagement Survey collected student demographic information and measured the students' perceptions on their engagement with the technology integrated into their 20-25 minutes of self-paced, independent work time. The Elementary Student Engagement Survey was administered both before the intervention as well as at the end of the intervention to see students' perceptions of their engagement behaviorally, cognitively, and emotionally throughout the data collection period. The survey was modified and shortened from the original Elementary Student Engagement Survey. The original survey contained a survey for the student's parent/legal guardian to complete in addition to a separate survey for the student to complete. The only questions that were used in this study were from the student survey. Additionally, the original Elementary Student Engagement Survey used a Likert 4-point scale (with 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*). For this study, I used face emoticons that will be transferred into a 3-point Likert scale with 1 = *disagree* (sad face), 2 = *no opinion/neutral* (neutral face), and 3 = *agree* (smiley face). Since there has not been any published research on the content validity or measurement of the internal consistency of the survey questions, I had two other third grade teachers at Peony Elementary School review the survey as an appropriate instrument for third grade students to complete. My peer educators offered no concerns with the modifications put in place.

Student Technology Perceptions Survey. The survey was created by me with question development being influenced from The New Teacher Project survey (2018) and the Audience Response Technology Questionnaire (MacGeorge et al., 2008). The New Teacher Project survey was designed to measure whether elementary school aged

students' experiences in school were engaging and worthwhile. The aspect of the survey that most closely aligned with the purpose of this study was the section that asked students to indicate their emotional engagement to what was being learned. The survey was oriented on the students' response to content learned that day and had many features of a long exit ticket. There are no published validity or reliability measures in using The New Teacher Project survey. The Audience Response Technology Questionnaire was designed to measure perceptions of higher education students using an Audience Response Technology (a Classroom Performance System). While the orientation of the questions asked aligned with the purpose of this study, the wording of questions required higher cognitive processing and reading level skills than that of my third grade students. Still, the intent of the questions asked inspired my Student Technology Perceptions Survey question development.

This Student Technology Perception Survey (Appendix D) asked students questions about their perspectives of integrating technology on their engagement and impact on their quality of learning map skills during their social studies class period. This survey was used to identify the students' perceptions on each technology tool used and technology integrated into learning about map skills. The Student Technology Perception Survey was divided into four sections. Section 1, consisting of 7 questions, asked about student behavioral and cognitive engagement. The students responded using face emoticons that were transferred into a 3-point Likert scale where 1 = *disagree* (sad face), 2 = *no opinion/neutral* (neutral face), and 3 = *agree* (smiley face). An example of a question asked in this section was "Using Google Earth, EdPuzzle, Jamboard and Pear Deck integrated technology motivated *me*." Section 2 examined emotional engagement

asking the student to respond *Yes* or *No* to nine emotions (happy, excited, successful, smart, confused, proud, focused, bored, angry) in relation to their feelings about using integrated technology. Section 3 returned to the students' responding using face emoticons that was transferred into a 3-point Likert scale where 1 = *disagree* (sad face), 2 = *no opinion/neutral* (neutral face), and 3 = *agree* (smiley face). This section consisted of 4 questions that focused on the students' perceptions on the impact of integrating technology on their quality of learning. An example of a question asked in this section was *I would like to use Google Earth, EdPuzzle, Jamboard and Pear Deck again in this social studies class*. The last section, Section 4, looked at how Google Earth, EdPuzzle, Jamboard and Pear Deck were implemented in the intervention specifically and asked the students to respond *Yes* or *No* to seven statements about each technology used. For example, "Because I used EdPuzzle, class was interesting". To obtain the student's perception of their favorite technology used during the intervention, question #20 listed Google Earth, EdPuzzle, Jamboard and Pear Deck and asked students were asked to mark their favorite to use. Two third grade peer educators at Peony Elementary School reviewed and offered feedback on the use of the Student Technology Perception Survey for its applicability towards third grade students.

Qualitative Data Sources

Qualitative research involves the collection of data such as case studies, personal experiences, life stories, interviews, artifacts, etc. (Johnson, Adkins, & Chauvin, 2020, Mertler, 2019). Qualitative data seeks to find connections across the data to provide a better understanding of what is being researched (Johnson et al., 2020). Qualitative studies often have the data collection and data analysis occur at the same time, "with

results of ongoing analysis informing continuing data collection" (Johnson et al., 2020, p. 141). Qualitative data gives the researcher an insight into the thoughts and voice of the participants and shares a narrative account of the data (Kajamaa, de la Croix, & Mattick, 2019, Mertler, 2019).

Semi-structured interviews. Interviews are an important data point for action research; some of the types of interviews include structured and semi-structured. Structured and semi-structured interviews both use predetermined questions (Efron & Ravid, 2020). Structured interviews are closed responses where the potential responses are determined prior to the interview. Semi-structured interviews are open-ended responses and allow the researcher and the participant to further discuss the research topics (Efron & Ravid, 2020). A semi-structured interview is a qualitative data collection tool that allows "the orientation of a predetermined interview process for the aim of research" (Erdogan & Akbaba, 2017, p. 118). Many studies incorporate semi-structured interviews as a data source to obtain participants' views and perspectives on the study (Erdogan & Akbaba, 2017; Güneş et al., 2020; Ismajli et al., 2020; Kumi-Yeboah et al., 2020).

Interviews with the participants were conducted to determine the students' perceptions on their learning experience after the implementation of the technology integration. The semi-structured interviews were used to hear the students' perceptions, both positive and negative, on integrating technology in learning about map skills. I asked questions to the student participants following an interview guide (Appendix E). Conducting semi-structured interviews allowed me to ask some specific questions I

crafted prior to the interview but to also ask alternative questions depending on where the student responses lead (Mertler, 2019).

The interviews took place at the end of the data collection phase after the technology integration had been implemented and the Map Skills post-assessment and surveys had been administered. The interviews were conducted with eight students, each interview taking approximately 10-20 minutes per student. Students were selected based on observations and performance on the pre- and post-test to have a selection of students ranging from high to low academic performance, as well as a range of students with high to low engagement. The demographics of students interviewed is found in Table 3.1. Some examples of the questions asked in the interview that supported the answer to research question three were "Share with me some examples when you found using EdPuzzle, Google Earth, Jamboard and Pear Deck during social studies to be enjoyable." "When we used EdPuzzle, Google Earth, Jamboard and Pear Deck, which one was your favorite to use? Share with me what you liked about using _____ and why?" and "Tell me a time when you felt like you were putting forth your best effort when you used EdPuzzle, Google Earth, Jamboard or Pear Deck."

Researcher's journal. Journals are used to provide detailed information on what takes place in the classroom throughout the study (Mertler, 2019). Not only do researchers record what they observe in the researcher journal, but they also make notes on trends and themes that they identify in their findings (Richards & Hemphill, 2018). An audit trail "maintained through the researcher journal also enhances transparency and allows for the process to be documented and adapted for use across multiple research projects" (Richards & Hemphill, 2018, p. 230).

I kept a researcher's journal in the form of a narrative account, which detailed my professional experiences of the study. I used the journal to reflect on my observations of the students interacting with technology, what I heard from the students during their activity time, and my reflective feelings of the observations. In looking for behavioral engagement, I anecdotally recalled how students' behaviors (e.g., time spent on task, sitting still, eyes focused on their screen, etc.) were observed. In thinking about emotional engagement, I was intentional to journal comments students made while engaged with the technology, what facial expressions I recalled observing, and other emotions (e.g., frustration, self-praise, enjoyment, etc.) I remembered observing. Johnson (2008) suggests that the researcher should stop and write what you see. I followed Mertler's (2019) suggestion of dividing my researcher's journal pages into two columns and used the left side for observations and the right side to interpret the observations.

Data Analysis

The mixed methods approach included both quantitative data as well as qualitative data. Once the data was collected for the study, it was then analyzed to determine any statistical significance, themes, and ultimately to answer the research questions. The data was analyzed using various forms of analysis. Quantitative data analysis consists of analyzing data using descriptive statistics to generate conclusions about the study (Mertler, 2019). Whereas qualitative data analysis incorporates inductive analysis to create themes and generate conclusions (Mertler, 2019). Table 3.4 shows the alignment of the research questions, the data sources used, as well as how the data was analyzed.

Table 3.4 *Research Questions, Data Sources, and Data Analysis*

Research Question	Data Collection Sources	Data Analysis
RQ1: What is the impact of technology integration on third grade students' academic performance in social studies?	• Map Skills Assessment (pre and post-test)	• Descriptive statistics • Paired samples *t*-test
RQ2: How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third grade social studies classroom?	• Elementary Student Engagement Survey (pre-post) • Student Technology Perceptions Survey • Researcher's Journal	• Descriptive statistics • Paired samples *t*-test • Inductive analysis
RQ3: What are third grade social studies students' perceptions about integrating technology on the quality of their learning experience?	• Student Technology Perceptions Survey • Exit Tickets • Semi-Structured Interviews	• Descriptive statistics • Inductive analysis

Quantitative Data Analysis

Student assessments. I analyzed the Map Skills assessments (pre- and post-test) to evaluate the impact of technology intervention on their academic performance. Descriptive statistics were used because they "allow researchers to summarize, organize, and simplify data" (Mertler, 2019, p. 12). Initially, descriptive statistics were used, where measures of central tendency were determined after having evaluate both the pre- and post-assessment data for the students' social studies knowledge. A paired samples *t*-test was conducted using Excel for the pre- and post- Map Skills assessment data to compare the pre- and post-test means and to determine the effect of technology integration on third grade students' academic performance in the social studies map unit curriculum. A paired samples *t*-test is used when the data is being collected in pairs (Gerald, 2018). Paired samples *t*-tests give the researcher an idea of whether the difference between the two sets

of data is statistically significant (Gerald, 2018). The alpha level was set at .05, which is the norm for most educational research studies (Mertler, 2019). Using descriptive statistics and a parametric test helped collect a large amount of information from the pre- and post- Map Skills assessments to determine a conclusion of the findings about a change in students' map skills knowledge from the start to the end of the intervention.

Exit tickets. Exit tickets were administered to the students to measure student perceptions on the integration of technology. The three emoticon responses on the exit tickets were converted into numerical data, where 1 = sad face, 2 = neutral face, and 3 = happy face. The numerical data was entered onto a spreadsheet and was analyzed using descriptive statistics, specifically measures of central tendency (mean and standard deviation), to show a score that represented an individual's performance as well as a group of participants academic performance (Mertler, 2019).

The combining of the pre- and post- Map Skills assessments and the exit tickets data numerically and statistically presented both the students' academic performance and the students' attitudes towards technology integration with the social studies content.

Surveys. The Elementary Student Engagement Survey and the Student Technology Perceptions Survey were administered to the students regarding both student engagement and student perception on the integration of technology into their learning map skills. Once the data was collected it was analyzed using descriptive statistics (mean and standard deviation). The use of descriptive statistics allows "researchers to summarize, organize, and simplify data" (Mertler, 2019, p. 12). Descriptive statistics provides a summary of the results and how spread out the results are, which creates a description for the data (Cooksey, 2020). Measures of variability (particularly the

standard deviation) provide a summary measure that gives an indication of how variable (or spread out) a particular sample of scores are. When used in conjunction with a relevant measure of central tendency (particularly the mean), a reasonable yet economical description of a set of data emerges (Cooksey, 2020). A paired samples *t*-test was conducted using Microsoft Excel for the Elementary Student Engagement Survey administered at the beginning and end of the study to determine the intervention's effect on student engagement and perceptions. The modifications of responses on the Elementary Student Engagement Survey to a 3-point Likert scale converted emoticon responses to numerical values (1 = sad face, 2 = neutral face, and 3 = smiley face). The two sections of the Student Technology Perceptions Survey that used a 3-point Likert scale had the emoticon face converted into a numerical value (1 = sad face, 2 = neutral face, and 3 = smiley face. The two sections of the Student Technology Perceptions Survey that use a *Yes* or *No* response converted a response of *Yes* into a point value of 1 and converted a response of *No* into a point value of 0. Using descriptive statistics helped collect information from the two surveys used to numerically present the students' attitudes about their engagement and their perceptions towards technology integration on their learning the social studies content.

Qualitative Data Analysis

Semi-structured interviews. I conducted semi-structured interviews with eight student participants. The recording of the interviews was transcribed and reviewed for transcription accuracy and so I could become familiar with the text. I used inductive analysis to analyze the semi-structured interview transcripts. The goal of inductive analysis is to reduce the amount of information collected by organizing the data into

themes, without minimizing or misinterpreting the data (Mertler, 2019). I collected all the data to review it and organize it into codes and themes to determine a conclusion (Creswell & Creswell, 2018). To code the data, I used colored highlighters to identify words and phrases that were repeated. The color-coded data was reduced further into categories by using Google Sheets to show where patterns developed, or similar words or phrases were combined. With further reflection and discussions with my dissertation chair, the emergence of themes coming out of the categories was found to best demonstrate student's perceptions of technology integration on their learning experience.

Researcher's journal. The researcher's journal was used to capture my reflective notes of the study throughout the data collection phase. The notes were added to the student interview responses and having all qualitative data sources combined, I used inductive analysis to watch for the emergence of themes. As noted above for inductive analysis, to code the data I used different colors on Google Sheets to identify when vocabulary and phrases are repeated. I used the coded data to make connections between the data and the research questions, as well as with data from other existing literature (Mertler, 2019). The researcher's journal notes were categorized and then further reflected upon to determine any themes regarding student engagement when technology integration is implemented into the social studies content. As well, the students' perceptions about integrating technology on the quality of their learning experience.

Procedures and Timeline

The phases written about in Table 3.5 outline the steps and the length of time anticipated for the implementation of technology integration in my third grade social

studies curriculum on map skills. This section discusses the length of time for each phase of the study: a) Phase 1: preparation for the study; b) Phase 2: the Map Skills pre-assessment for the social studies unit; c) Phase 3: technology integration into social studies; d) Phase 4: the implementation of technology; e) Phase 5: data analysis; and f) Phase 6: share findings.

Phase 1: Preparation

Prior to the study, during the fall of 2022, I sought University of South Carolina International Review Board (IRB) approval (Appendix F) as well as district approval to conduct my dissertation research. I sought consent and assent forms from the participants/their guardians (Appendix G and Appendix H, respectively). This took place during the fall of the 2022 school year and lasted no longer than a week.

Phase 2: Map Skills Pre-assessment

The participants completed the Map Skills pre-test assessment during phase 2. The Map Skills Assessment took one day to complete and was conducted at the beginning of the unit in November 2022. The Map Skills Assessment had students identify different types of maps, and match terms for longitude, latitude, primer meridian, equator, and hemispheres to images of a globe. They also used an alphanumeric grid to locate continents and oceans, answered questions on where we live and some of the landforms that are in our area, and they labeled the cardinal directions on a compass rose. This was one part of the quantitative data.

Table 3.5 *Timeline of Procedures*

Phases	Procedures	Length of Time
Phase 1: Preparation	• Seek IRB approval and school/district approval • Seek consent and assent forms from participants/their guardians	Fall - September 2022
Phase 2: Map Skills Pre-assessment	• Pre-assessment completed	1 day in October 2022
Phase 3: Technology Integration	• Present and model forms of technology being integrated	5 days in October/November 2022
Phase 4: Implementation	• Implement Google Earth, EdPuzzle, Jamboard and Pear Deck	20 academic days in October and November 2022
	• Post-assessment completed	1 day in November 2022
	• Student surveys completed	1 day in November 2022
	• Interviews with students	8 days in November and December 2022
Phase 5: Data Analysis	• Semi-structured interviews transcribed	2 weeks in December 2022
	• Analysis of quantitative and qualitative data sources	6 weeks - January to February, 2023
Phase 6: Share Findings	• Share findings with my dissertation committee, student participants, their parents, other school stakeholders, and at selected conferences.	Summer of 2023

Phase 3: Technology Integration

During Phase 3, I introduced the format of the unit/implementation to the students. During the first week of Phase 3, I introduced and demonstrated the different forms of technology used by the participants. The forms of technology integrated into my

third grade social studies curriculum on maps consisted of Pear Deck slides, EdPuzzle interactive videos, Jamboard small group activities, and Google Earth. I modeled for the students how to use each of these tools when they were first introduced within the intervention. The modeling was done for five minutes, after my instruction and before the students' independent work time. Google Earth, EdPuzzle, Jamboard and Pear Deck were each implemented a couple of times throughout the twenty days of instruction. A brief refresher about the technology being used as well as offering students any assistance with using the technology took place at the beginning of each lesson/activity.

Phase 4: Implementation

I implemented 20-25-minutes of technology integration activities into the third grade social studies curriculum for 20 academic days. The technology integration lessons consisted of a brief review of the technology to be used followed by students engaging in that technology integrated activity. At the conclusion of each unit, the students completed an exit ticket. Throughout the implementation of technology integration, I also observed the participants and their behavioral and emotional engagement with the technology integration activities and anecdotally recorded my reflections in my researcher's journal. The participants completed the post-assessment near the end of Phase 4. Additionally, the students were administered the Elementary Student Engagement Survey and the Student Technology Perceptions Survey at the end of the 4-unit map skills unit to determine their perspective on the implementation of technology integration activities on their engagement with the technology and the impact of the technology on their learning about social studies. The last task completed in Phase 4 was conducting semi-structured

interviews with eight participants to obtain their views of technology integration from the perspective of student engagement and the quality of their learning experience.

Phase 5: Data Analysis

I collected the Map Skills post-assessment data and compare it to the Map Skills pre-assessment data. I used descriptive statistics and a paired samples *t*-test to compare the pre- and post-test assessment data. Descriptive statistics were also used with the two surveys administered and the exit tickets. The semi-structured interviews were transcribed and combined with the researcher's journal. All qualitative data sources were analyzed using inductive analysis where the emergence of themes developed out of that process.

Phase 6: Share Findings

In this phase I shared my findings with my dissertation committee, my students, the parents, as well as other district stakeholders. I plan to hold a professional development for the other teachers and stakeholders at my school to share my findings. I also hope to share my findings with other professionals in the field at local, state, and national conferences.

Rigor and Trustworthiness

In my research I am using various methods of rigor and trustworthiness. Rigor is defined as "the quality, validity, accuracy, and credibility of action research and its findings" (Mertler, 2019, p. 314). Trustworthiness is defined as "verification of the consistency of various sources of qualitative data while accounting for their inherent biases; focuses on the accuracy and believability of the data" (Mertler, 2019, p. 315). According to a study conducted by Boyraz & Türkcan (2020) trustworthiness can be

ensured when using a variety of data collection tools to increase data diversity, as well as sharing the data with experts. The rigor and trustworthiness methodologies used are a) thick, rich descriptions, b) triangulation, c) peer debriefing, d) audit trail, and e) member checking.

Thick, Rich Descriptions

Thick and rich descriptions are "where robust descriptive language is used to provide sufficient contextual information" (Johnson et al., 2020, p. 145). Thick, rich descriptions describe in detail aspects of your study as well as the findings (Creswell & Creswell, 2018). The description of the classroom and the participants gives a more realistic insight and adds to the validity of the study (Creswell & Creswell, 2018). The setting and the participant section of this study provides additional information to get a better understanding of the environment of the study. Thick, rich descriptions come from detailing my role, outlining the rigor and trustworthiness of the research, identifying ethical concerns, as well as the appropriate data collection tools are used for the qualitative research portion of the study (Fornaro, Sterin, & Struloeff, 2020). The thick, rich descriptions offer details of the participants and their perspectives, from the qualitative data including the researcher's journal and the semi structured interviews. The themes identified from the qualitative data sources represent the students' perspectives on the integration of technology into the social studies curriculum. Describing the relationship between the results of the quantitative data and the qualitative data add to the thick, rich descriptions (Mentz & de Beer, 2021).

Triangulation

Triangulation is the collection of multiple data sources which are then used to identify themes and subsequently conclusions for the study (Creswell & Creswell, 2018). Triangulation occurred at the end of the data analysis process. All qualitative data and quantitative data were collected and analyzed, and the results from the qualitative data were used to identify any themes from the research, while the quantitative data revealed numerical and statistical correlations between the data. The quantitative data came from student surveys, exit tickets, and Map Skills pre- and post-assessment data. The qualitative data came from the semi-structured interviews and my researcher's journal. Creswell and Miller (2000) define triangulation as "a validity procedure where researchers search for convergence among multiple and different sources of information to form themes or categories in a study" (p. 126). Triangulation shows the compatibility between the numerical quantitative data with the themes that emerged from the qualitative data. The qualitative data further explained the results of the numerical quantitative data. The converged qualitative data and quantitative data revealed similarities as well as any discrepancies. The triangulation of data, combining and analyzing both the quantitative and the qualitative data together, added to the rigor and trustworthiness of the study by ensuring that the data and results are accurate.

Peer Debriefing

Peer debriefing is the use of other professionals, such as coworkers and dissertation committees, to help with reviewing the data collected, data analysis and data interpretation (Mertler, 2019). The peer debriefing process "requires the researcher to provide detailed notes to another trained researcher" (Scharp & Sanders, 2019, p. 118). A

peer debriefer is often a researcher who is not directly involved in the study or the data analysis, yet who is familiar with the study (Richards & Hemphill, 2018). An outside peer debriefer can be invited to provide feedback on the data analysis to help add credibility. When the peer debriefer is assisting with the qualitative data analysis process they review any coding involved in the data analysis and recommend any changes before the final coding process (Richards & Hemphill, 2018). Peer debriefing occurred when I met weekly with my dissertation chair to discuss every aspect of my dissertation. I also sought advice from scholars in the field serving on my dissertation committee. These interactions helped deepen my thinking, help prevent bias, and offered additional opinions and insight to make my research stronger and more rigorous.

Audit Trail

Audit trail or external audit is the use of an outside individual who reviews and evaluates the research (Mertler, 2019). This outside individual could be a colleague who is not involved in the research. This, as well as peer debriefing provide an opportunity for a different set of eyes and minds to review and evaluate the research. This will hopefully help enhance the credibility of the research (Mertler, 2019). Audit trails can also be done through keeping a researcher journal (Richards & Hemphill, 2018). The audit trail in the researcher journal allows for detailed notes to be taken on the research and therefore makes it easier for others to replicate the research (Scharp & Sanders, 2019). I used audit trail through my researcher journal by taking detailed notes on every aspect of the study, as well as by letting other educators review my research.

Member Checking

Member checking is the process of asking the participants of the study to review the research report, specifically the interview notes and any other observational notes from the research (Mertler, 2019). This is supposed to enhance the rigor of the research by allowing the participants to ensure that it is an accurate account of their perspectives. I conducted member checking through allowing my participants to check the interview transcripts saying "That is right" after the questions were asked so that the students could check the accuracy of their responses.

Plan for Sharing and Communicating Findings

Sharing and communicating the findings of my study educates others in my field on integrating technology in the third grade social studies classroom. An area of notable importance is that there exists a gap in the existing literature where an elementary school social studies classroom is the setting, and third grade students are the participants for research to be situated within. Sharing my findings with peers in the elementary education field allows others to learn the implications and limitations of integrating technology into the classroom. Limitations can include internet access for students, access to technology, teacher's attitudes about technology, teachers' beliefs about use of computers, and a teacher's willingness to adapt to a changing technological world (Durff & Carter, 2019). A teachers' comfortability with using technology is also a limitation to integrating technology in the classroom (Durff & Carter, 2019).

The primary participants of the research were the students. The outcomes of this research will be shared via a presentation with my colleagues (teachers from grades K-6 as well as Related Arts teachers and Special Education teachers), students, their parents,

and school administration at Peony Elementary School as they were all stakeholders in this research. When sharing the data, any student identification, such as their name and birthday, was omitted and gender-neutral pseudonyms were used instead of student names. All stakeholders will be invited to an evening meeting to share the findings of my research. This will be an in person presentation using PowerPoint as the modality for the presentation delivery of the research findings. I will share a similar presentation of the findings about the implementation of technology integration into a third grade social studies class with other district stakeholders as requested. Following the presentation, I will include a link to a Google form for their thoughts and suggestions for change to be captured. This feedback will help determine any further inquiry about technology integration in social studies or determine if another cycle of action research is needed with guidance for what that could look like.

I hope to be able to share my research at local conferences, such as the Summer Academy and the Upstate Technology Conference. Summer Academy is a local conference to provide educators with new techniques that they can use in the classroom. Summer Academy caters to all teachers from K-12. I would also hope to present at the Upstate Technology Conference, which is a conference for educators who want to share ideas about technology integration in the classroom. This would not only cater to teachers in my district, but also to teachers across the state. On the state level I plan to share my research at the SC EdTech Conference, which is an educational technology conference for educators to discuss the best ways to integrate technology into the classroom. A national conference at which I would like to present and share my findings is the International Society for Technology in Education (ISTE) conference. This conference

caters to a larger audience of educators where educators have an opportunity to share their ideas and their practices with each other. I would share my findings at these various conferences with all the educators through a PowerPoint presentation.

CHAPTER 4

ANALYSIS AND FINDINGS

This purpose of this action research was to evaluate the impact of technology integration on third grade social studies students' academic performance and their engagement with the content at Peony Elementary. Both quantitative and qualitative data were collected to answer the research questions: 1) What is the impact of technology integration on third grade students' academic performance in social studies? 2) How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third grade social studies classroom? 3) What are third grade social studies students' perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck to learn map skills? This chapter will discuss the analysis and findings of the quantitative sources as well as the analysis of the qualitative sources.

Quantitative Analysis and Findings

This study used four quantitative data sources: 1) Map Skills Assessment pre and post-test, 2) exit tickets, 3) Elementary Student Engagement Survey, and 4) Student Technology Perception Survey. This section will discuss the results of each quantitative data source using descriptive statistics, an internal consistency test, tests of normalcy, and inferential statistical analysis when appropriate. Excel was used to compile and run all the quantitative data.

Map Skills Assessment

The Map Skills Assessment was created using South Carolina social studies state standards to assess map skills. Two third grade teachers at Peony Elementary School collaborated with me to create the pre and post-test map skills assessment instrument. These peer educators helped make sure that the pre- and post-test was aligned to each section of content being covered and ensured the assessment was aligned to the SC standards. The pre-test was administered at the beginning of the data collection period before the technology tools intervention were introduced and the post-test was distributed at the completion of the intervention at the end of the implementation phase. The social studies unit pre-test was the same as the post-test. The student assessment consisted of 27 multiple choice and short answer questions that were worth a total of 30 points. All 14 student participants completed both the pre-test and post-test Map Skills Assessment.

Descriptive statistics. Descriptive statistics are a summary of the data collected using numbers (Adams & Lawrence, 2019). Descriptive statistics were used to summarize the mean and standard deviation that were calculated (Creswell, 2014). The mean and standard deviation for both the pre and post-test Map Skills Assessment were calculated to see if there was an increase in the questions answered correctly from the third grade students. The maximum score for both tests was 30. Table 4.1 shows the mean and standard deviation of the pre and post-test Map Skills Assessment scores. The pre-test had a mean score of 9.91 (SD = 3.51). The post-test had a mean score of 18.43 (SD = 6.68).

Table 4.1 *Descriptive Statistics for the Map Skills Student Assessment (N = 14)*

Map Skills Assessment	*M*	*SD*
Pre-test	9.91	3.51
Post-test	18.43	6.68

The mean and standard deviation for both the pre and post-test Map Skills Assessment were calculated according to which statements aligned with which South Carolina standard. These were calculated to see if there was an increase in each map skills standard. Table 4.2 shows the mean and standard deviation for the Map Skills Assessment statements for each South Carolina standard used in the unit. The mean score of statements pertaining to standard 3.1.1.AG was 6.69 (*SD* = 4.01) on the pre-test and 10.19 (*SD* = 3.49) on the post-test. The mean score of statements pertaining to standard 3.1.2.AG was 0.6 (*SD* = 0.89) on the pre-test and 4.6 (*SD* = 1.52) on the post-test. The mean score of statements pertaining to standard 3.1.3.PR was 4.17 (*SD* = 3.37) on the pre-test and 10.17 (*SD* = 2.23) on the post-test. The mean of Map Skills Assessment statements pertaining to standard 3.1.3.PR increased the most from the pre-test to the post-test. This suggests that the students grew the most in what they learned throughout the unit. The data can also suggest that the students had little prior knowledge about the political and physical features of the area they live in before the intervention. Many of the participants before the intervention could not identify the city, state, or continent they live in, and could not name any significant physical features in the surrounding area. The mean of Map Skills Assessment statements pertaining to standard 3.1.1.AG increased the least from the pre-test to the post-test. This suggests that the students knew the most about alphanumeric grids and how to locate continents and oceans on the alphanumeric

grids, students also had a good understanding before the intervention about the cardinal directions. Overall students performed the best on Map Skills Assessment statements pertaining to standard 3.1.1.AG and performed the lowest on standard 3.1.2.AG. This suggests that standard 3.1.2.AG was probably more difficult content for the students, this could be due to the large amount of vocabulary words required to be memorized, such as latitude and longitude.

Table 4.2 *Descriptive Statistics for the Map Skills Assessments Statements Pertaining to South Carolina State Standards*

	Map Skills Assessment Statements			
South Carolina State Standard	*M* (pre-test)	*M* (post-test)	*SD* (pre-test)	*SD* (post-test)
3.1.1.AG: Utilize an alphanumeric grid to locate the continents and oceans.	6.69	10.19	4.01	3.49
3.1.2.AG: Locate the world's four hemispheres (i.e., northern, southern, eastern, and western) by using the major components of latitude and longitude (i.e., the Equator, the Prime Meridian, lines of latitude (i.e., parallels), lines of longitude (i.e., meridians), and the International Date Line).	0.6	4.6	0.89	1.52
3.1.3.PR: Identify the spatial hierarchy of political and physical geographic features.	4.17	10.17	3.37	2.23

Figure 4.1 shows the percentage of questions answered correctly for the pre and post- Map Skills Assessment. Question 21, "Which continent do you live on?" had the highest increase in the percentage of students who answered correctly from the pre-test to the post-test; with 7% of students having answered correctly on the pre-test to 79% of the students having answered correctly on the post-test. Overall, the data show that the mean

number of questions answered correctly by the students increased from the pre-test to the post-test Map Skills Assessment.

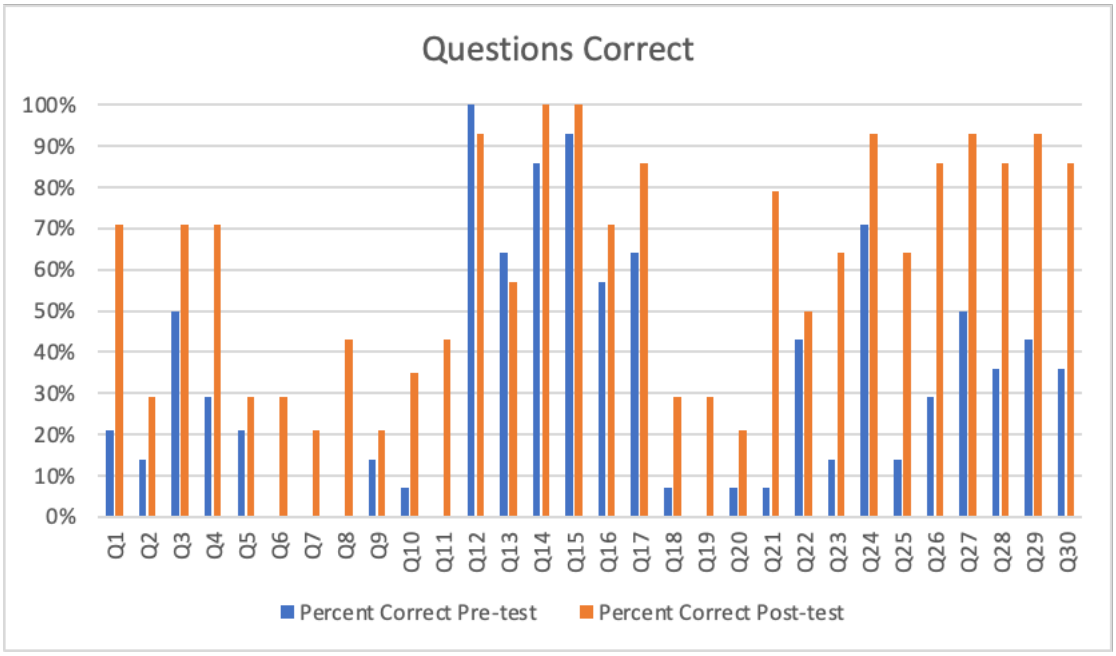


Figure 4.1 Percent of Students who Answered Correctly for the Map Skills Student Assessment (N = 14)

Reliability. The reliability of the Map Skills Assessment was tested on the pre and post-test data ($N = 14$) for the 27 questions with a total of 30 points. To assess the reliability, or internal consistency, of the Map Skills Assessment pre and post-test data, I calculated the Kuder Richardson (KR) 20. The results ($p_{KR20} = .86$) suggest a good level reliability (Traub, 1994).

Inferential statistics. Inferential statistics were used to test the hypotheses and draw conclusions (Lee, Dinis, Lowe, & Anders, 2016). Inferential statistics were used to test the hypothesis that the technology tool integration would impact student academic performance. Inferential statistical analysis involved conducting the Shapiro-Wilk test, as this test checks for normality within a set of data (Razali & Wah, 2011). The Shapiro-Wilk normality test (Razali & Wah, 2011; Shapiro & Wilk, 1965) ran on both the pre-test

and the post-test Map Skills Assessment identified non-significant results suggesting the data does not significantly deviate from a normal distribution (pre-test, $p = .43$; post-test, $p = .67$). Since the values were greater than the standard of $p < .05$ (Mbah & Paothong, 2015), a paired-samples *t*-test was calculated to compare the mean of the pre-test score to the mean of the post test score. The mean of the pre-test Map Skills Assessment score was 9.91 (SD = 3.51), and the mean of the post-test Map Skills Assessment score was 18.43 (SD = 6.68). Therefore, a significant increase from the Map Skills Assessment pre-test to the post-test was found, $t(13) = -5.88$, $p<.001$.

Exit Tickets

Exit tickets throughout the unit were used to measure and monitor student perceptions on the use of each technology tool and to offer their collective perspectives (Green, 2016) regarding technology integration into their class activities. The exit tickets were administered each time a technology tool was used during the intervention. To analyze the exit ticket data, the exit tickets were sorted in Excel according to each technology tool used: Google Earth, EdPuzzle, Jamboard, and Pear Deck. The exit ticket student responses used face emoticons which were transferred into a 3-point Likert scale data point, with 1 = *disagree* (sad face emoticon), 2 = *neutral* (neutral face emoticon), and 3 = *agree* (smiley face emoticon). Throughout the 20 day intervention, the students completed an exit ticket regarding Google Earth three times, EdPuzzle two times, Jamboard three times, and Pear Deck four times. The total number of exit tickets completed for each tool is shown in Table 4.2. Of the twelve times that an exit ticket was administered, there were two days that 12 students were present and completed the exit

ticket, five days that 13 students were present and completed the exit ticket, and five days that all 14 students were present and completed the exit ticket.

Descriptive statistics. The descriptive statistics for each technology tool are shown in Table 4.3. Descriptive statistics were conducted to compare the mean of the student exit ticket responses for each technology tool to see if one was preferred more than the others. The mean response for student perceptions about using Google Earth was 2.38 (*SD* = 0.88). The mean response for student perceptions about using EdPuzzle was 2.29 (*SD* = 0.89). The mean response for student perceptions about using Jamboard was 2.44 *(SD* = 0.78). The mean response for student perceptions about using Pear Deck was 2.32 (*SD* = 0.88). Each of the technology tools mean scores were above neutral and towards an agreement response which suggests that students had positive perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck when studying map skills during the social studies class time.

Table 4.3 *Descriptive Statistics for Exit Tickets (N = 14)*

Technology Tool	Number of Observations	*M*	*SD*
Google Earth	40	2.38	0.88
EdPuzzle	26	2.29	0.89
Jamboard	39	2.44	0.78
Pear Deck	54	2.32	0.88

Elementary Student Engagement Survey

The Elementary Student Engagement Survey collected student demographic information and measured the students' perceptions on their engagement with the technology integrated into their 20-25 minutes of self-paced, independent work time. The

Elementary Student Engagement Survey was administered both before the intervention as well as at the end of the intervention. The survey was structured so three forms of engagement could be identified: questions 1-4 reflected behavioral engagement responses, questions 5-7 reflected cognitive engagement responses, and questions 8-9 reflected emotional engagement responses. For this study, the third grade students responded using face emoticons that were transferred into a 3-point Likert scale with 1 = *disagree* (sad face emoticon), 2 = *neutral* (neutral face emoticon), and 3 = *agree* (smiley face emoticon). All 14 third grade students completed the Elementary Student Engagement Survey, both prior to the intervention beginning and after the intervention concluded.

Descriptive statistics. Descriptive statistics are shown in Table 4.4 for the pre and post intervention Elementary Student Engagement Survey. The overall mean score of the Elementary Student Engagement Survey pre intervention was 2.81 (SD = 0.49), and the mean score of the post intervention survey was 2.83 (SD = 0.45). The mean score of the behavioral engagement responses decreased from the pre intervention (M = 2.88, SD = 0.38) to the post intervention (M = 2.79, SD = 0.49). The mean score of the cognitive engagement responses increased from the pre intervention (M = 2.83, SD = 0.44) to the post intervention (M = 2.95, SD = 0.22). The mean score of the emotional engagement responses stayed the same from the pre intervention (M = 2.71, SD = 0.60) to the post intervention (M = 2.71, SD = 0.60). All three types of engagement had relatively high means which suggests students were engaged behaviorally, cognitively, and emotionally during the intervention.

Table 4.4 *Descriptive Statistics for Elementary Student Engagement Survey (N = 14)*

Questions	*M* (pre)	*M* (post)	*SD* (pre)	*SD* (post)
Elementary Student Engagement Survey Total	2.81	2.83	0.49	045
Behavioral Engagement	2.88	2.79	0.38	0.49
Cognitive Engagement	2.83	2.95	0.44	0.21
Emotional Engagement	2.71	2.71	0.60	0.60

Reliability. The reliability of the Elementary Student Engagement Survey instrument was tested with the pre and post intervention data ($N = 14$). Overall, the Cronbach Alpha's test of internal consistency (Tavakol & Dennick, 2011) was questionable ($\alpha = .64$). The internal consistency for the behavioral engagement responses was poor ($\alpha = .57$). The internal consistency for the cognitive engagement responses was unacceptable ($\alpha = .20$). The internal consistency for the emotional engagement responses was unacceptable ($\alpha = .36$).

Inferential statistics. The Shapiro Wilk test of normality (Razali & Wah, 2011; Shapiro & Wilk, 1965) was conducted, using a $p < .05$ outcome to indicate if the data deviates from a normal distribution. The outcome of the Shapiro Wilk Test showed each engagement subscale of the Elementary Student Engagement Survey to deviate from normality (behavioral engagement section, $p < .001$, cognitive engagement section, $p < .001$, emotional engagement section, $p < .001$), so the nonparametric Wilcoxon test was conducted. The Wilcoxon test was used for the pre and post intervention of the Elementary Student Engagement Survey to compare two sets of scores that come from the same participants and to identify any change in scores from one time point to another (Wilcoxon, 1945). For the total Elementary Student Engagement Survey, the Wilcoxon test result suggested there was no statistical significance $Z = -0.64$, $p = .48$. For the

behavioral engagement data, the Wilcoxon test result suggested there was no statistical significance, Z = 1.02, p = .30. For the cognitive engagement data, the Wilcoxon test result suggested there was no statistical significance, Z = -1.83, p= .09. For the emotional engagement data, the Wilcoxon test result suggested there was no statistical significance.

Student Technology Perception Survey

The Student Technology Perception Survey asked students questions about their perspectives of integrating technology on their engagement and the impact on their quality of learning map skills during their social studies class period. The Student Technology Perception Survey is divided into four sections. Section 1, consisting of 7 questions, asked about student behavioral and cognitive engagement. The students responded using face emoticons that were transferred into a 3-point Likert scale where 1 = *disagree* (sad face emoticon), 2 = *neutral* (neutral face emoticon), and 3 = *agree* (smiley face emoticon). Section 2 examined emotional engagement asking the student to respond *Yes* or *No* to nine statements about emotions they felt when using integrated technology (happy, excited, successful, smart, confused, proud, focused, bored, angry). For data analysis, a response of *Yes* was assigned a value of 1 and a response of *No* was assigned a value of 0. Section 3 asked students four questions about their perceptions on the impact of integrating technology on their quality of learning. Again, the students' responded using face emoticons that were transferred into a 3-point Likert scale where 1 = *disagree* (sad face emoticon), 2 = *neutral* (neutral face emoticon), and 3 = *agree* (smiley face emoticon). The last section, Section 4, explored the student's perceptions for how each of the technology tools Google Earth, EdPuzzle, Jamboard and Pear Deck were

implemented in the intervention specifically and asked the students to respond *Yes* or *No* to seven statements about each technology tool used. For data analysis, a response of *Yes* was assigned a value of 1 and a response of *No* was assigned a value of 0. All 14 student participants in this study completed the Student Technology Perception Survey.

Descriptive statistics. Descriptive statistics are shown in Table 4.5 for the Student Technology Perception Survey questions 1-7 and 9-12. Questions 1-7, regarding behavioral and cognitive engagement, produced a mean score of 2.78 (*SD* = 0.55). Question 3 which asked students, "Using Google Earth, EdPuzzle, Jamboard and Pear Deck motivated me*",* had the highest response with every student saying they agreed with the statement (*M* = 3.00, *SD* = 0.00). Question 4 which asked students, "Because I used Google Earth, EdPuzzle, Jamboard and Pear Deck, I was more engaged in class than I otherwise would be"*,* had the lowest response (*M* = 2.43, *SD* = 0.76).

Questions 9-12, regarding the student's perceptions about the impact of integrating technology on their quality of learning, produced a mean score of 2.93 (*SD* = 0.32). Questions 10 and 12 which asked respectively, *I would like to use Google Earth, EdPuzzle, Jamboard and Pear Deck again in this Social Studies class,* and *I wish we spent more time using Google Earth, EdPuzzle, Jamboard and Pear Deck* had the highest response with every student saying they agreed with the statement (*M* = 3.00, *SD* = 0.00). Question 9 which asked students, "Because I used Google Earth, EdPuzzle, Jamboard and Pear Deck, I am more aware of how I am performing in class", had the lowest response (*M* = 2.76, *SD* = 0.58).

Table 4.5 *Descriptive Statistics for Questions 1-7 and 9-12 from the Student Technology Perception Survey (N = 14)*

Questions	*M*	*SD*
Behavioral and Cognitive Engagement	2.78	0.55
Perceptions on Quality of Learning	2.93	0.32

Determining the frequency of a score appearing is "a simple count of how many times that score occurred in the sample" (Adams & Lawrence, 2019, p. 135) and another way to report data outcome using descriptive statistics. The frequency is written as a number count as well as the rate or in the form of a percentage. Rate is the "measurement of one value for a variable in relation to the entire sample of values" (Kaur, Stoltzfus, & Yellapu, 2018, p. 61). Percentage is the proportion of the frequency count for the participants (Adams & Lawrence, 2019). The rate was calculated out of a total 14, representing the total number of students who completed the Student Technology Perception Survey. Descriptive statistics for Question 8 from the Student Technology Perception Survey are shown in Figure 4.2. Question 8 asked students, "When learning map skills using Google Earth, EdPuzzle, Jamboard and Pear Deck, I felt", and students responded *Yes* or *No* to each of the nine emotions offered: happy, excited about learning, successful, smart, confused, proud, focused, bored, and angry. Our of the 14 students, 13 (93%) said that they felt happy about the technology used in this study. The least chosen feeling was *bored* where only 1 out of 14 (7%) students responded yes. None of the students (0%) chose yes that they felt angry about the technology integrated into the map skills lesson. The feeling that produced the greatest discrepancy in the students' responses was focused; with 9 out of 14 (64%) students responding yes they felt focused and 5 out of 14 (36%) students marking no to the feeling of focused.

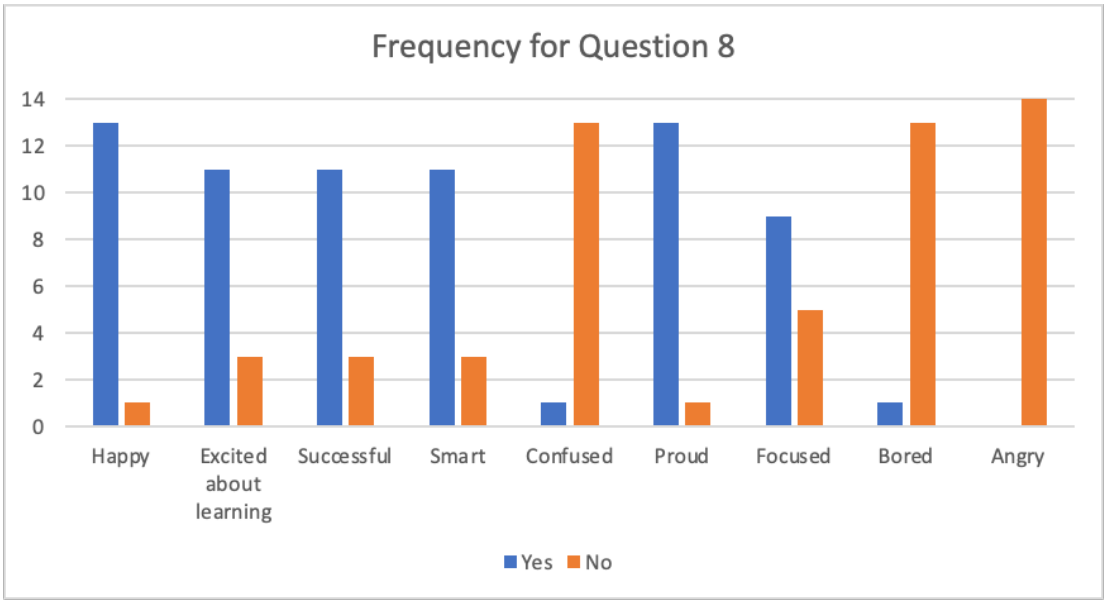


Figure 4.2 Frequency for Question 8 from the Student Technology Perception Survey (N = 14)

Descriptive statistics for Questions 13-19 on the Student Technology Perception Survey are shown in Table 4.6. This section of questions asked the students to respond either *Yes* (1) or *No* (0) to a statement about each of the four technologies integrated into the lesson. Question 13 asked students, "Using Google Earth, EdPuzzle, Jamboard, and Pear Deck was fun." The technology tool that had the largest number of students responding Yes was Google Earth with 14 out of 14 (100%) students reporting Yes they found Google Earth to be fun. The technology tool that had the smallest number of students responding Yes was EdPuzzle with 11 out of 14 (79%) students answering Yes. Question 14 asked students, "I enjoyed using Google Earth, EdPuzzle, Jamboard, and Pear Deck." The technology tool that had the largest number of students responding Yes was Google Earth with 14 out of 14 (100%) students reporting Yes they found Google Earth to be enjoyable to use. For the three other technology tools, 12 out of 14 (86%) students responded Yes to EdPuzzle, Jamboard, and Pear Deck being enjoyable to use.

Question 15 asked students, “Using Google Earth, EdPuzzle, Jamboard, and Pear Deck was easy.” The technology tool that had the largest number of students responding Yes was Google Earth with 14 out of 14 (100%) students reporting Yes they found Google Earth to be easy to use. The technology tool that had the smallest number of students responding Yes was Jamboard with 11 out of 14 (79%) students reporting Yes they found Jamboard to be easy to use. Question 16 asked students, “I had no problems using Google Earth, EdPuzzle, Jamboard, and Pear Deck.” The technology tool that had the largest number of students responding Yes was Google Earth with 12 out of 14 (86%) students reporting Yes they experienced no problems when using Google Earth. The technology tool that had the smallest number of students responding Yes was EdPuzzle with 8 out of 14 (57%) students reporting Yes they experienced no problems when using EdPuzzle. Question 17 asked students, “It was exciting to answer questions about map skills using Google Earth, EdPuzzle, Jamboard, and Pear Deck.” The technology tool that had the largest number of students responding Yes was Google Earth with 14 out of 14 (100%) students reporting Yes they found Google Earth to be exciting when answering map skills questions. EdPuzzle and Jamboard had the smallest number of students responding Yes with each having 11 out of 14 (79%) students reporting Yes they found EdPuzzle and Jamboard to be exciting when answering map skills questions. Question 18 asked students, “Because I used Google Earth, EdPuzzle, Jamboard, and Pear Deck, class was interesting.” The technology tool that had the largest number of students responding Yes was Pear Deck with 14 out of 14 (100%) students reporting Yes they found using Pear Deck to make the class interesting. For the three other technology tools, each had 13 out of 14 (86%) students responding Yes to using Google Earth, EdPuzzle, and Jamboard in

making the class interesting. Question 19 asked students, "I really like what we did using [tool], to learn map skills." The technology tool that had the largest number of students responding Yes was Google Earth and Pear Deck, both with 14 out of 14 (100%) students reporting Yes they really liked using both Google Earth and Pear Deck to learn map skills. The technology tool that had the smallest number of students responding Yes was EdPuzzle with 11 out of 14 (79%) students reporting Yes they really liked using EdPuzzle to learn map skills.

Table 4.6 *Frequency for Questions 13-19 from the Student Technology Perception Survey (N = 14)*

	Google Earth		EdPuzzle		Jamboard		Pear Deck	
	Yes	No	Yes	No	Yes	No	Yes	No
Q13	14	0	11	3	13	1	13	1
Q14	14	0	12	2	12	2	12	2
Q15	14	0	12	2	11	3	12	2
Q16	12	2	8	6	9	5	11	3
Q17	14	0	11	3	11	3	13	1
Q18	13	1	13	1	11	3	14	0
Q19	14	0	11	3	12	2	14	0

Descriptive statistics for the last question on the Student Technology Perception Survey, Question 20, were calculated as a frequency count and percentage. The descriptive statistics outcome for Question 20 is shown in Table 4.7. Question 20 asked students, "My favorite technology to use was," and the students were to indicate just one of the four technologies (Google Earth, EdPuzzle, Jamboard, or Pear Deck) integrated into the student's 20-25 minutes of self-paced, independent work time. Google Earth was the technology tool identified by 11 out of 14 (79%) students as their favorite technology

to use. Jamboard was not marked by any of the students (0%) as the technology tool they identified as their favorite technology to use.

Table 4.7 *Frequency for Questions 20 from the Student Technology Perception Survey (N = 14)*

Technology Tool	Google Earth	EdPuzzle	Jamboard	Pear Deck
Frequency Count	11	2	0	1
Percentage	79%	14%	0%	7%

Qualitative Findings and Interpretations

This study used two qualitative data sources: 1) semi-structured interviews and 2) the researcher journal. This section will present the qualitative findings of this study. The semi-structured interviews were recorded using a memos app and then transcribed through a transcribe app. A close review of the data transcribed took place for accuracy. After the semi-structured interviews were conducted with the students and transcribed, I read the responses back to the students seeking confirmation of accuracy in their responses. Delve, a CAQDAS software program, was used to code both qualitative data sources. The semi-structured interview transcriptions were then uploaded to Delve. The researcher notes were recorded in a notebook and scanned and uploaded to Google Drive where they were then uploaded to Delve. A sentence-by-sentence unit of analysis took place during four rounds of first cycle coding resulting in 211 codes being generated. There were 196 codes generated from the semi-structured interviews and 15 codes were generated from the researcher journal (see Table 4.8). This qualitative analysis focused on the 1) First Cycle Coding, 2) Code Mapping, 3) Second Cycle Coding, and 4) Themes and Findings.

Table 4.8 *Qualitative Codes*

Qualitative Data Source	Number of Sources	Number of Codes Applied
Semi-Structured Interviews	8	196
Researcher Journal	1	15
Total	9	211

First Cycle Coding

The first coding cycle method utilized was *Structural Coding. Structural Coding uses* "codes and initially categorizes the data corpus to examine comparable segments' commonalities, differences, and relationships" (Saldaña, 2016, p.98). For this study, the commonalities and relationships were made between the qualitative data sources used to answer research questions two and three. The qualitative data was then coded in alignment to the research questions. For example, research question 2 centered around three types of engagement: behavioral engagement, cognitive engagement, and emotional engagement. When Peyton's semi-structured interview response reflected their finding about the use of technology, specifically EdPuzzle, "made it easy to pay attention," this sentence was coded as *RQ2.* While students shared using technology to be easy, other students, for example Peyton, responded in their semi-structured interview that they found aspects of the technology to be difficult, such as using the drawing tools on Pear Deck and Jamboard "I just like how you drag it." This was a student's perception of using technology; therefore, this sentence in the qualitative data was coded as *RQ3*.

Next, the data was then coded using *Process Coding. Process Coding*, also referred to as "action coding" (Saldaña, 2016, p.111), denotes where action can be determined from what the participants were describing in their interview responses. The data, therefore, was coded using an action word. For example, Kennedy shared in his semi-structured interview "working hard." The action identified as taking place was the

student was putting forth effort and the *Process code* generated was *more effort.* Additional examples of codes generated from using the *Process Coding* method included *searching, rewatching, exploring,* and *paying attention*. A total of 70 codes were applied during *Process Coding*.

The third round of coding used was *Attribute Coding*, where attributes of the participants were coded to further help understand the student population. According to Saldaña, *Attribute Coding* "provides essential participant information and contexts for analysis and interpretation" (2016, p. 83). Mertler (2020) states that analyzing qualitative data is not just focusing on the data, but also the setting, the participants and anything that can contribute to the study. An example of an Attribute code generated was *focus*. This code was generated from my researcher journal when I commented on how some students seemed to focus better when they were using the technology tools for their assignment (see Figure 4.3). The *Attribute code, difficulty with spelling*, was generated from Dylan's semi-structured interview response where they were expressing their inability to spell well made using EdPuzzle and Jamboard difficult to use "sometimes I have trouble spelling." Additional examples of codes generated from using the *Attribute Coding* method included *typing being difficult, struggling to focus,* and *struggling to remember*. A total of 59 codes were applied during *Attribute Coding*.

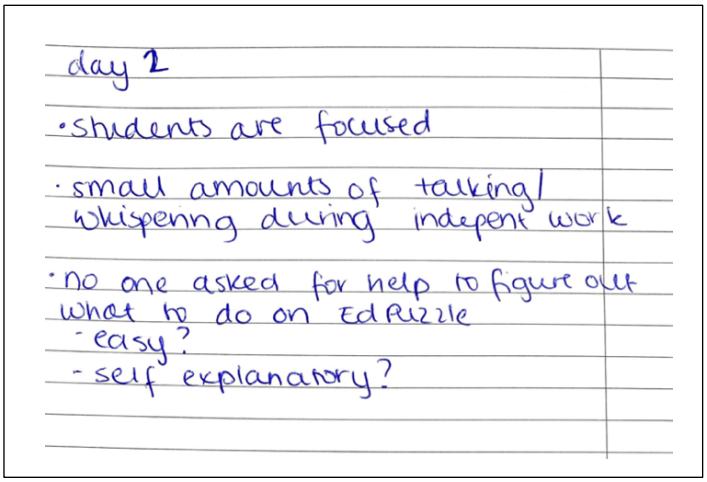


Figure 4.3 Example from researcher journal.

In Vivo Coding was the fourth method of first cycle coding used. During *In Vivo Coding* the participants' words were coded as a direct quote. This captures the students' exact words which "enhances and deepens an adult's understanding of their cultures and worldviews" (Saldaña, 2016, p. 106). Use of *In Vivo Coding* also brought the students' voices into the qualitative data findings. For example, Peyton shared in their semi-structured interview, "But since it's paper it'll be longer or more questions are on one." This meant that with the Chromebooks it was better instead of paper because each question was on a new slide for Jamboard and Pear Deck, which helped them to *focus.* The *In Vivo code* of "*Chromebook better instead of paper"* was generated to capture the students' perception, using their own words, how they preferred to use their Chromebook instead of completing an assignment with paper and pencil. Dylan said in their semi-structured interview, "When I get a like bad score, next time I will know what I need to improve my score… I wasn't really struggling with, but I don't even know what I got my score (EdPuzzle)." The *In Vivo code* of "*improving my score"* was created. Additional examples of codes generated from using the *In Vivo Coding* method included "*choosing*

answer was easy," "paper is black and white,"" Jamboard textbox was tricky," and "*see the whole world."* A total of 80 codes were applied during *In Vivo Coding*.

Code Mapping

After completing four methods of first cycle coding, and all the data was coded, the codes were uploaded to a Google Sheet. First, I consolidated like or similar codes. For example, *rewatching* was created as a code six times. So, to reduce the corpus of data moving forward, *rewatch* became just one code to manage. This process reduced the 211 initial codes generated down to 109 unduplicated codes.

Code mapping then took place as a means of "organizing and assembling the codes developed" before initiating second cycle coding (Saldaña, 2016, p. 218). Using the coloring feature in Google Sheets, the unduplicated codes were then colored and grouped by similarities. This resulted in 17 subgroups being created (see Figure 4.4). For example, six unduplicated codes included the word typing (i.e., *typing easy, dislike typing, retype*); therefore, the subgroup of Typing was created. Another example was ten codes were generated that carried a negative connotation (i.e., *submit confusing, difficult questions, overwhelming*). These ten codes were then grouped together into the formation of the Negative comments subgroup. The 17 subgroups created were: Maps and Continents, Google Earth, Tools, Visuals, Positive Comments, Effort, Pay Attention, Distractions, Paper Something, Color on Chromebook, Typing, Negative Comments, Difficult, Question Type, Feedback, Exploration, and Videos.

Benfits of using technology	**25**	**Engagement: Increa:**	**58**	**Opposing views on Chromebook vs Paper/Pencil**	**30**	**Negative comments & Difficulties**	**32**	**Videos in EdPuzzle, positive and negatives**	**24**
Maps and continents	**5**	**Distractions**	**33**	**paper something**	**10**	**negative comments**	**25**	**video**	**24**
learn more about maps and continents		reduce distractions		all questions on one sheet of paper		bad memory		remind you of the answer	
google earth	**4**	headphones		paper is black and white		submit confusing		difficult stop and answer questions	
know where everything is		external distractions		paper instead		dislike emotion check		questions at the end	
searching		hard to focus		Chromebook better instead of paper		frustration		didn't like the videos stopping	
know answers		**pay attention**	**4**	paper		difficult questions		pause	
Tools	**9**	easy to pay attention		paper or pencil		not user friendly		remembering	
zoom into places		pay attention		digital		less effort		rewatching	
microphone tool for spelling		focus		handwriting		too many words		rewinding	
interactive		looking at computer		no paper or pencil		overwhelming		can't look back at video	
visuals	**7**	**Effort**	**21**	**colors on chromebook**	**7**	nervous		control learning	
the answers were on the map picture shown just had to find		future		colors made eyes bright		**Difficult**	**7**	questions during video	
going from the largest to the smallest continent to city		dragging		like color on the computer		difficult		more information	
assignment like a book		motivation		improve score		difficulty with spelling			
one question per screen		more effort		**typing**	**9**	drawing tool was difficult			
Positive attributes when using technology	**23**	work hard		typing easy		remembering difficult		**Google Earth specific qualitites**	**12**
positive comments	**23**	higher cognitive load		long typing responses		jamboard textbox was tricky		**exploration**	**12**
interesting		cognitive load		dislike typing		more to figure out		around the world	
simple activity				typing easier		dragging was difficult		see the whole world	
simple				retype				learn about new places	
liked pictures				typing struggles		**Variety of assessment questions**	**7**	finding places	
easier than paper				more pictures on chromebook	**4**	**Question Type**	**3**	exploring	
choosing answer was easy						variety of question types		places	
easy to use						multiple choice questions		travel	
simpler						not learning anything just assessing	**1**	explore	
engaging						**feedback**	**3**	explporing	
favorite						no reminders		travelling	
best effort						no feedback		investigating	
helpful						feedback/grade			
fun									
entertaining									
easy									
break down content									
straightforward									

Figure 4.4 Subgroups.

Second Cycle Coding

The second cycle coding method incorporated was *Pattern Coding. Pattern Coding* involves "inferential codes that identify an emergent theme or explanation" (Saldaña, 2016, p.236). In discussions where peer debriefing took place with one of my dissertation chairpersons, there were several iterations of analysis of the codes that led to the development of subgroups. Additional analysis of the subgroups and discussion with my dissertation chair, specifically looking to identify similarities and patterns within the subgroups of codes, further narrowed down the 17 subgroups into seven categories. For example, seeing a pattern among the subgroups Maps and continents, Tools, Visuals, and Positive comments about the students seeing the benefits of using technology in learning map skills resulted in the category Benefits of using technology.

Themes and Findings

Themes are defined by Saldaña (2016) as "an outcome of coding, categorization, and analytic reflection, not something that is coded" (p. 198). Vaismoraldi, Jones, Turunen, and Snelgrove (2016) assert that themes are the main product of data analysis that yields practical results in the field of study. Vaismoraldi et al. (2016) also state that the analysis of themes is important to define the themes and to describe how the themes emerged. Inductive analysis takes place to identify the themes from the data. Kiger and Varpio (2020) explain that inductive analysis is a process of deriving themes from the data. In inductive analysis, researchers watch for themes to emerge from the coded data. Therefore, the themes will be linked to the original coded data and will be reflective of all the data. Through the process of peer debriefing with my dissertation co-chair, three themes emerged out of the qualitative data in this study: 1) technology integration

impacted behavioral, cognitive, and emotional engagement, 2) benefits and challenges of technology integration, and 3) the qualities of Google Earth and EdPuzzle on their learning.

Theme one: technology integration impacted behavioral, cognitive, and emotional engagement. The first theme to emerge centered around how technology integration impacted the students behavioral, cognitive, and emotional engagement. Engagement is important in students' learning. In this study engagement is defined as the effort or energy that the students show toward their learning in the map skills social studies unit. Engagement was measured using the Student Engagement Survey and the Student Technology Perceptions Survey to determine student perceptions of technology integration, as well as the semi-structured interviews and the researcher's journal.

Behavioral engagement is defined as the actions exhibited from the students such as participation in learning, positive behavior, being on-task, paying attention, asking questions, and participating in class discussions (Havik & Westergård, 2020). Examples of behavioral engagement were seen in the following excerpt of Peyton and Dylan's semi-structured interview responses:

Peyton: It was easy to pay attention using EdPuzzle.

Dylan: It motivated me to focus more.

Utilizing headphones also helped block out noise from other students, which helped them pay attention. A study conducted by Kaur et al. (2017) used iPads to help students with different learning styles; the ability to use headphones helped the auditory learners. The students' perceptions showing how the integration of technology tools, specifically EdPuzzle increasing behavioral engagement, was found in this study.

Cognitive engagement is defined as the way that students learn and the strategies that work best for them (Taylor & Parsons, 2011). Additionally, students want their teachers to understand how they learn and use that to guide instruction (Taylor & Parsons, 2011). An example of cognitive engagement from this study could be seen from notations offered in the researcher journal such as "visual learners" where Peyton and Dylan were overheard voicing their preference for working on their Chromebook instead of on paper since the images are in color. It is not uncommon that paper assignments appear in black and white on the paper, including a lack of visuals aspects on the paper assignment. I also made two notations in my researcher journal, "headphones" and "reduce distractions." This observation recording was in relation to Cassidy, Kennedy, Charlie, Shawn, and Blake showing to be more focused on their work when they used their headphones when watching the EdPuzzle video or when they seemed to be paying greater attention to the video to correctly answer the questions.

Emotional engagement is defined as the feelings either positive or negative that students have toward their school, their learning, teachers, classmates. Emotional engagement is defined by Parsons et al. (2018) as affective engagement, which includes student interest, enjoyment, enthusiasm, and efficacy in their learning. Examples of positive emotional engagement could be seen in Kennedy and Charlie's semi-structured interview responses:

Kennedy: I loved Google Earth… it was fun.

Charlie: Most like entertaining and helped me (Google Earth).

Conversely, both Kennedy and Charlie also offered a negative emotional engagement response in their semi-structured interview comments:

Kennedy: Sometimes I get frustrated when we do Pear Deck.

Charlie: The video is making me nervous.

These responses reflected the student's emotional engagement through both their positive and negative feelings towards the technology integrated into this study. Their positive and negative student perceptions of the technology integrated into this research provides insight into what technology tools they did or did not like and what they did or did not like about integrating technology into learning about map skills.

Two categories, Engagement and Variety of assessment questions, were subsumed into the Theme 1 (see Figure 4.5). Through peer debriefing in analyzing what was taking place in these two categories was the different ways that students were engaged in the lesson, referring to behavioral, cognitive, and emotional engagement, as well as the various question types the students were given from all the technology tools integrated into the map skills lesson.

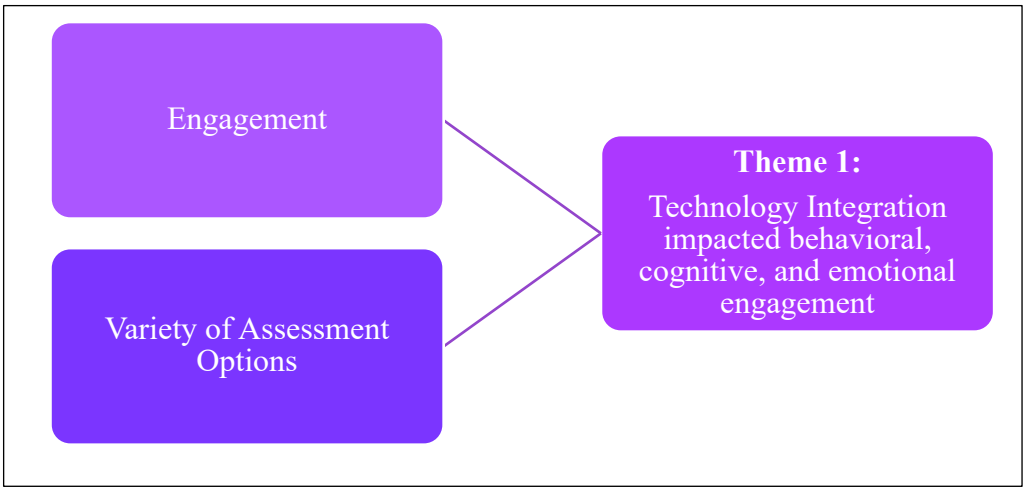


Figure 4.5 Categories within theme one.

Engagement. In this study, the category – Engagement – identified times the students felt they were engaged in their learning and what led to them being engaged with their learning about map skills. Analysis of these codes revealed the students found the

use of technology in their learning about map skills to be engaging. Therefore, the category Engagement in this study shows that incorporating technology into learning about map skills can help engage students in their learning. The *In Vivo codes* of "*easy to pay attention"* and "*focus"* combined with the *Process code* of *motivation* supported how the students were engaged and wanted to do the work that they were assigned. Students wanting to do their work falls under emotional engagement due to the fact that wanting to do work is an emotional response. Peyton and Cassidy shared the following comments in their semi-structures interviews about when they were paying attention using technology:

> Peyton: I would pay more attention with that technology (Pear Deck).
>
> Cassidy: It was easy to pay attention when I was on the videos with my headphones (EdPuzzle).

Students identifying how the technology tool integration helped them pay better attention to what they were learning further supports that integrating technology into social studies can help with student engagement. Students exhibit different behaviors during instruction and paying attention is a form of behavioral engagement, if students are paying attention to the instruction then they are engaged in what they are learning. This finding is supported by the research of Carstens, Mallon, Bataineh, and Al-Bataineh (2021) who also found the integration of technology with K-12 students resulted in their students finding the technology motivated them more to learn.

Another pattern found within the codes that led to the development of this category was how the students found the use of technology helped reduce distractions in the classroom. When students are exhibiting on-task behavior, which falls under behavioral engagement due to students doing their work and what they are supposed to

do, and are more focused on doing their work, then this reduces other behaviors such as disrupting classmates, which is an unwanted behavior. This could be seen in the *In Vivo code* "*headphones"* and the *Process code reduce distractions*. Taylor shared their comment in the semi-structured interview about how headphones reduced distractions, "It was easy to pay attention, you could just listen to the headphones." This category subsumed the subgroups of Distractions, Pay Attention and Effort, from which a total of 58 codes was generated (see Figure 4.6).

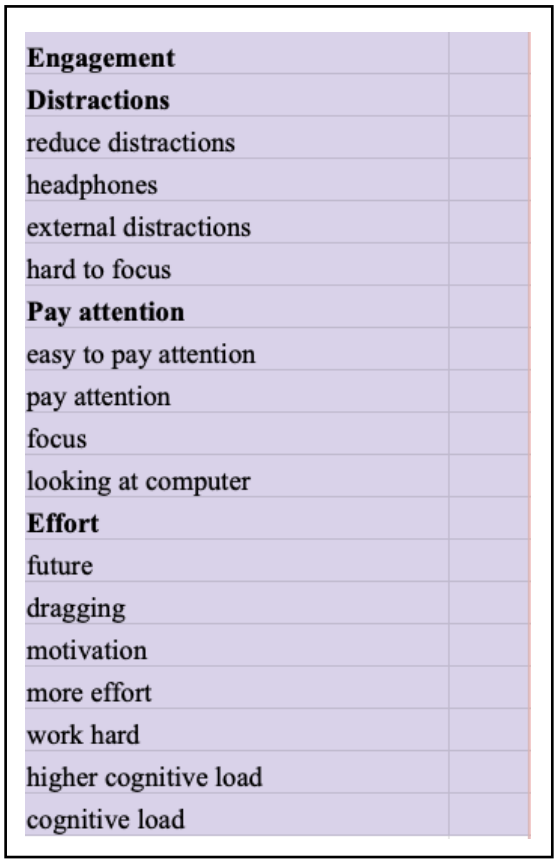


Figure 4.6 Engagement category.

Variety of assessment questions. In this study, the category – Variety of assessment questions – the students shared the different styles of questions that they encountered with the various technology integration and their opinions on the variety of assessment questions. Analysis of these codes revealed the students overall had positive

opinions on the variety of assessment questions when using technology in their learning about map skills. This finding is supported by the research of Kurvinen, Kaila, Laakso, and Salakoski (2020) who also found a positive response from their students when the integration of technology offered a variety of question types and provided students with feedback on their performance. Peyton offered the following semi-structured interview responses, "give us multiple things to do" and, "I liked how there was like multiple choices." From these responses, the *In Vivo codes* of "*variety of question types"* and "*multiple choice questions"* were created. When the participants were given a variety of technology tools that provided a variety of question types and things to do, it kept them engaged in what they were doing. Students behavior' was focused more on doing their work and less on off-task behaviors such as talking to their classmates. This supported that the students were given a variety of assessment questions and that perceptions of using a variety of assessment questions within the integrated technology options offered were predominantly positive.

Another pattern found within the codes of this category was how the students appreciated the feedback that was offered by the technology integrated for some of the assessment questions. This could be seen in the *Process codes feedback* and *saw grade* that were created out of semi-structured interview responses of the following students:

> Dylan: I wasn't really struggling with, but I don't even know what I got my score… Because when I get my, when I get a like bad score, next time I will know what I need.
>
> Riley: So that I thought I was doing good.

The responses showed that the feedback offered within the integrated technology introduced in this study was seen to benefit the students' motivation to learn as well as support their academic performance. Providing students with a variety of question/ assessment types met the diverse learning needs of the students. Having a variety of question/assessment types also allowed students to show their learning in different ways so that the teacher could get a good idea on what the students understood about what they are learning during the map skills lesson. Consistent with cognitive engagement and the way that students learn and the strategies that work best for them, the various technologies provided strategies to help with the students' learning. Some students were better at answering open ended questions while others were better at answering multiple choice questions. This category subsumed the subgroups Question Types and Feedback, where a total of seven codes was created (see Figure 4.7).

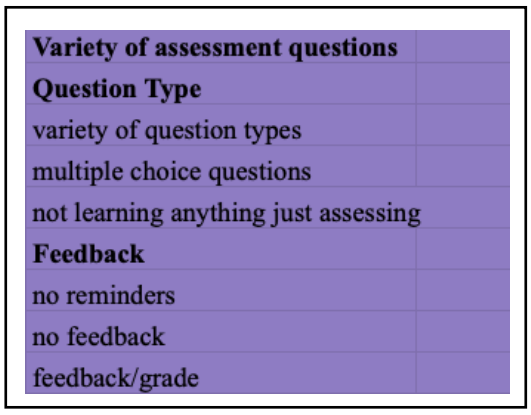


Figure 4.7 Variety of assessment questions category.

Theme two: benefits and challenges of technology integration. Theme two focused on the benefits and challenges of technology integration. Every student learns differently and has different preferences for their learning, whether that is using different forms of technology or learning using paper instead. Technology integration is defined by Davies and West (2014) as the "transformation or enhancement of teaching and learning

practices using technology" (p. 1). Technology integration is defined in this study as the use of technology to support instructional methods, and in the student learning process, specifically during the student independent activity portion of the lesson. Students used the four technology tools in the social studies curriculum about map skills to demonstrate what they learned. Examples of benefits of technology were seen in Peyton, Charlie, and Morgan's semi-structured interview responses:

> Peyton: Google Earth, it was easy to use it because you could type in words, you could type in places that you wanted to go, and it would just take you there.
>
> Charlie: Google Earth… Most like, entertaining and helped me.
>
> Morgan: It would be easier to type and stuff.

From these responses, the feature of typing in a location and it quickly taking the student to that destination for additional exploration was seen as a benefit of using the Google Earth technology in this study.

An example of negative comments or when I observed students to be having difficulties when using technology could be seen from notations offered in the researcher journal. For example, it was noted in the researcher journal that Cassidy, Charlie, and Taylor were frustrated, as evident by each student shouting out and complaining about the difficulty when using EdPuzzle. Also, Peyton offered the following in their semi-structured interview response, "[Jamboard textbox and drawing tool] it was like hard to draw cause you couldn't get in the right place with it." Examples of opposing views showing a preference of using paper and pencil vs. their Chromebook for completing assignments could be seen in students' semi-structured interview responses:

> Charlie: I can't type.

Cassidy: Instead of having the dragging tool, we could have used paper and just circled it or colored it.

These comments reflected the opinions of students' preferences to continue the use of paper assignments instead of using technology, like their Chromebooks, for completing tasks offered during the map skills lesson. Additionally, there were some students who did not have an opinion either way. This suggested that some students preferred the use of paper and pencil as the delivery method of the assignments and some preferred technology. Furthermore, some students offered no opinion either way about the use of traditional paper and pencil assignments or use of their Chromebook technology.

Three categories, Benefits of using technology, Negative comments and difficulties, and Opposing views on Chromebook vs. paper/pencil, were subsumed into Theme 2 (see Figure 4.8). Through peer debriefing and discussions with my dissertation chair about what the students were experiencing or expressing, I further analyzed that what was taking place in these three categories were the aspects of students' using technology and how that may have helped or hindered their learning. We discussed both the positive and negative aspects of technology integration that students' mentioned in their semi-structured interview responses. Additionally, I found what the students' liked and did not like about using technology, and whether they would have preferred their assignments to be offered on paper instead.

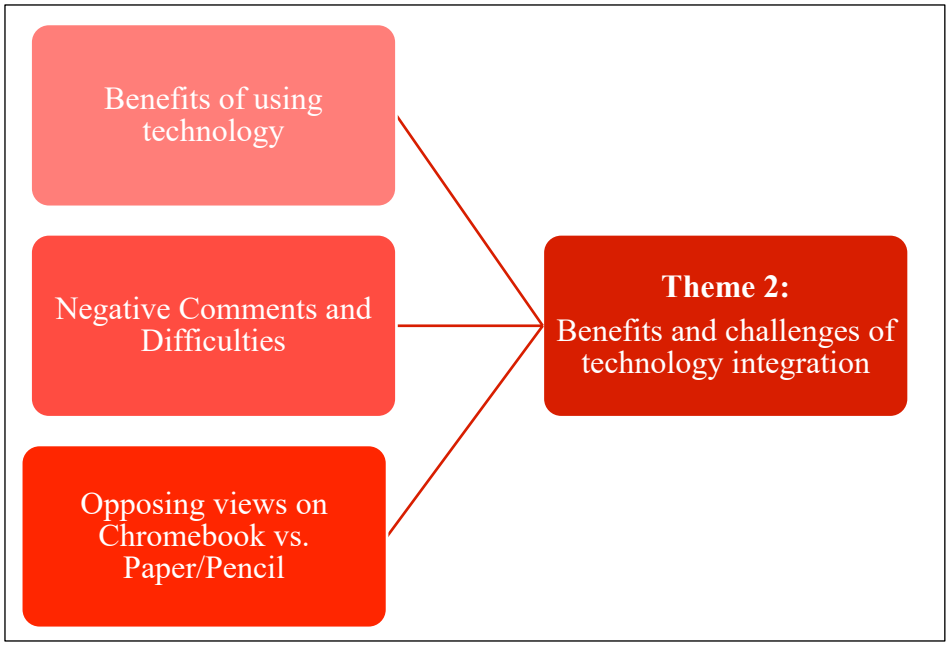


Figure 4.8 Categories within theme two.

Benefits of using technology. In this study, the category – Benefits of using technology –the students identified many benefits of using the integrated technology options in their learning map skills. Therefore, the category benefits of using technology in this study suggests that there are benefits for students to incorporating technology into learning about map skills. For example, students in the semi-structured interviews discussed the benefits of using technology by emphasizing how easy and engaging it was when learning about maps:

Riley: All you had to do was just look up a place and find it.

Morgan: It was easy to drag something.

Charlie: Google Earth was entertaining, it helped.

From the responses the *In Vivo* codes of "*just had to find it"* and "*it was easy"* were created. When combined with the *Process codes* of engaging and entertaining and the *Attribute codes* of *favorite* and *simpler,* the pattern found within the data revealed how

the students' found some benefits of using technology (being easy, engaging, and entertaining) and this furthered their learning about map skills.

One student's perceptions of whether they wanted to use paper or their Chromebook in their learning about map skills was shared in Cassidy semi-structured interview response, "I'd rather do this on the Chromebook." Use of a Chromebook is another example of technology being used in my classroom, and Cassidy identified how using a device instead of a paper assignment was a preference but also aligns as being a benefit of using integrated technology in the map skills curriculum. This category subsumed the subgroups of Map and Continents, Tools, Visuals, and Positive Comments, from which, a total of 48 codes were generated (see Figure 4.9).

Benfits of using technology	
Maps and continents	
learn more about maps and continents	
Tools	
zoom into places	
microphone tool for spelling	
interactive	
Visuals	
the answers were on the map picture shown just had to find	
going from the largest to the smallest continent to city	
assignment like a book	
one question per screen	
more pictures on chromebook	
Positive comments	
interesting	
simple activity	
simple	
liked pictures	
easier than paper	

Figure 4.9 Benefits of using technology category.

Negative comments and difficulties. In this study, the category – Negative comments and difficulties – students identified aspects of integrated technology that they either did not like or that they struggled with. Identifying negative comments in the study can also suggest areas for improvement. The *In Vivo codes* of "hard to *focus*" and

"nervous" combined with the *Process codes of frustration* and *confusing* showed how there were aspects of technology integration that the students did not like. For example, students offered the following in their semi-structured interview responses:

> Dylan: I know what the questions say, but it's just hard for me to focus and listen to the questions (EdPuzzle).
>
> Kennedy: Sometimes I get frustrated when we do Pear Deck.
>
> Charlie: The video is like making me nervous.
>
> Taylor: Yeah, because I did not know how to like submit.

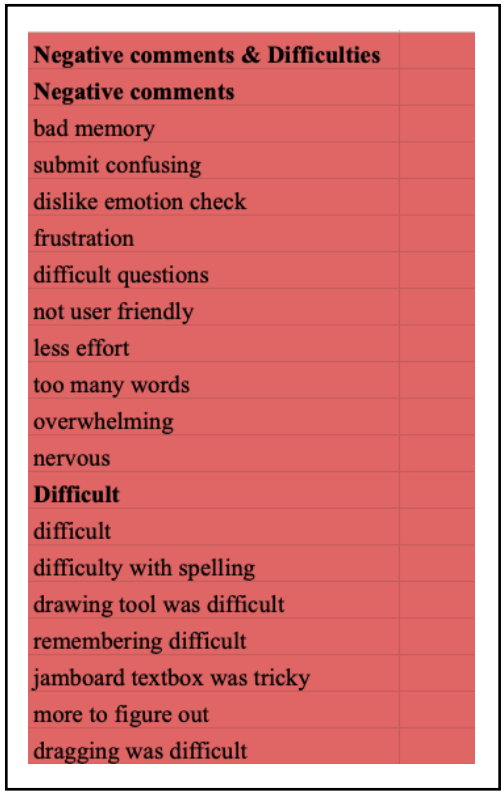
Analysis of these codes revealed the students had some negative opinions on the use of technology in their learning about map skills. The research of Haselhorst (2017) found the integration of technology in sixth through eighth grade classrooms negatively affected students' attention spans, their ability to complete difficult tasks, and their social skills.

Another pattern found within the codes that led to this category being created was how the students found the use of technology difficult. This could be seen in the *Process codes drawing tool was difficult* and *Jamboard textbox was tricky* as well as in the *Attribute codes* of *remembering was difficult*. The semi-structured interview student responses below show the students' thoughts on what they found difficult when using the various technology tools:

> Kennedy: We had these questions every 10 minutes… we had to stop.
>
> Peyton: Some people don't have a lot of good memory so you can't remember it that much [EdPuzzle questions].

The responses showed the students' perceptions on the aspects of technology integration that they did not like when learning map skills. Therefore, there are some aspects of

integrating technology that students might not enjoy and could be adjusted in the future. Also, this reflects something that students could improve on, such as having more time to work with the drawing tool in Pear Deck to become more comfortable or proficient in using these tools. This category subsumed the subgroups Negative Comments and Difficult from which a total of 32 codes was created (see Figure 4.10).



Negative comments & Difficulties	
Negative comments	
bad memory	
submit confusing	
dislike emotion check	
frustration	
difficult questions	
not user friendly	
less effort	
too many words	
overwhelming	
nervous	
Difficult	
difficult	
difficulty with spelling	
drawing tool was difficult	
remembering difficult	
jamboard textbox was tricky	
more to figure out	
dragging was difficult	

Figure 4.10 Negative comments & difficulties category.

Opposing views on Chromebook vs. paper/pencil. In this study, the category – Opposing views on Chromebook vs. paper/pencil – students describe their preferences on using their Chromebook as opposed to using a paper and pencil assignment when learning about map skills. Analysis of these codes revealed the students had positive opinions on the use of Chromebooks compared to the use of paper and pencil activities. This finding is supported by the research of Powell (2022) who also found the use of Chromebooks in a third grade classroom resulted in students preferring using their

Chromebooks for assignments. Powell found that students had a stronger desire to complete assignments when they used their Chromebooks and the students seemed confident in their computer skills. The *In Vivo codes* of "*Chromebook better instead of paper"* and "*typing is easy"* combined with the *Process code* of *typing* showed how the students preferred using a Chromebook over paper. Two students offered examples in their semi-structured interview responses:

Cassidy: I'd rather do this on the Chromebook.

Morgan: It would be easier to type.

Taylor: Because it was on a Chromebook instead of paper.

Another pattern found within the codes that led to the development of this category was how the students found that there were certain characteristics for why they preferred using their Chromebook instead of a paper assignment. This could be seen in the *In Vivo codes* "*the color on the Chromebook*" and *"color pictures on Chromebook*" as well as in the *Attribute codes* of *liking digital* and *Chromebook better instead of paper*. Two students offered examples in their semi-structured interview responses:

Peyton: For a piece of paper, it gives you questions, like it doesn't have much pictures... it (Chromebook) could show us pictures in color.

Riley: No, I wouldn't have liked to do it on paper cause that would be harder to write stuff.

Peyton: The colors on the Chromebook made my eyes bright so I could pay attention.

Another pattern found within the codes that led to the development of this category was how the students found that there were certain characteristics for why they

preferred using a paper assignment instead of using their Chromebook. This could be seen in the *In Vivo codes* "*paper instead*" and *"pay attention*" as well as in the *Attribute codes* of *paper*. Two students offered examples in their semi-structured interview responses:

Kennedy: I pay better attention on paper.

Taylor: I'll probably use paper instead of EdPuzzle.

The responses showed whether the students' would have preferred paper assignments or assignments offered on their Chromebook, identifying some students preferred paper while some were happy to do their work on their Chromebook. A study conducted by Kaur et al. (2017) found the use of iPads helped students with different learning styles, the ability to use headphones helped auditory learners and the touchscreen helped students who are kinesthetic learners by being able to move things around. The mixed views in this study on whether students preferred learning using paper, or their Chromebook suggests that students learn in different ways. This category subsumed the subgroups Paper Something, Color on Chromebook, and Typing, from which a total of 26 codes was generated (see Figure 4.11).

Opposing views on Chromebook vs Paper/Pencil	
Paper something	
all questions on one sheet of paper	
paper is black and white	
paper instead	
Chromebook better instead of paper	
paper	
paper or pencil	
digital	
handwriting	
no paper or pencil	
Colors on Chromebook	
colors made eyes bright	
like color on the computer	
improve score	
Typing	
typing easy	
long typing responses	
dislike typing	
typing easier	
retype	
typing struggles	

Figure 4.11 Opposing views on Chromebook vs. paper/pencil category.

Theme three: **qualities of Google Earth and EdPuzzle on their learning.**

Theme three focused on third grade students' perceptions about the qualities of Google Earth and EdPuzzle on their learning. Out of all four of the technology tools that were used, students preferred using Google Earth and EdPuzzle the most. Consoli, Désiron, and Cattenao (2023) describe how technology integration is more of a process rather than a state, and the focus of technology integration centers more around technological tools and services. The students used the four technology tools integrated into the map skills social studies unit to demonstrate what they learned about map skills. Google Earth and EdPuzzle were the two most discussed and referred to by the students and were the technology tools that the students identified preferring the most. Some examples of the students preferring Google Earth and EdPuzzle were shown in the following two semi-structured interview responses:

Kennedy: I was happy when we first did Google Earth… it was fun to look up places.

Riley: EdPuzzle… it's just more fun to watch a video… then to look at places on Google Earth.

Examples of positive attributes specifically of EdPuzzle videos that impacted the students learning were seen in two students' semi-structured interview responses:

Dylan: EdPuzzle basically remind you of the answer.

Cassidy: Because it would be better because like if I just watch the music, if I just watch the video the whole time video and then I go back through the questions I might forget so I could like, like I watch the video.

Examples of positive qualities of Google Earth that impacted the students learning could be seen in Peyton and Taylor's semi-structured responses, respectively, "I liked about it because you could learn about new places that you didn't like know before" and "Google Earth you could just search and just type things in." Conversely, examples of negative comments about EdPuzzle specifically could be seen from three student's semi-structured interview responses:

Riley: (EdPuzzle) Moved a little too fast.

Taylor: It was like stopping answering questions…. I like to answer questions at the end.

Kennedy: I wanted to do EdPuzzle on paper.

These students did not like how fast the EdPuzzle videos were or that the questions were embedded throughout the videos instead of at the end.

Google Earth was seen as the students' favorite technology tool that was used during the technology integration in learning about map skills with EdPuzzle being the second most favorite technology tool used. Interestingly, there were no negative comments about Google Earth shared from any of the third grade students.

Two categories, Videos in EdPuzzle, Positive and negative and Google Earth pecific qualities were subsumed into Theme 3 (see Figure 4.12). Through peer debriefing and discussions with my dissertation chair, our analysis of the data revealed the two categories that formed theme three were the positive and negative thoughts that students had about using EdPuzzle, as well as the aspects of what they liked about Google Earth. Google Earth was also the technology tool that students discussed the most in the semi-structured interviews. Both Google Earth and EdPuzzle were found to benefit the students in learning map skills in this study.

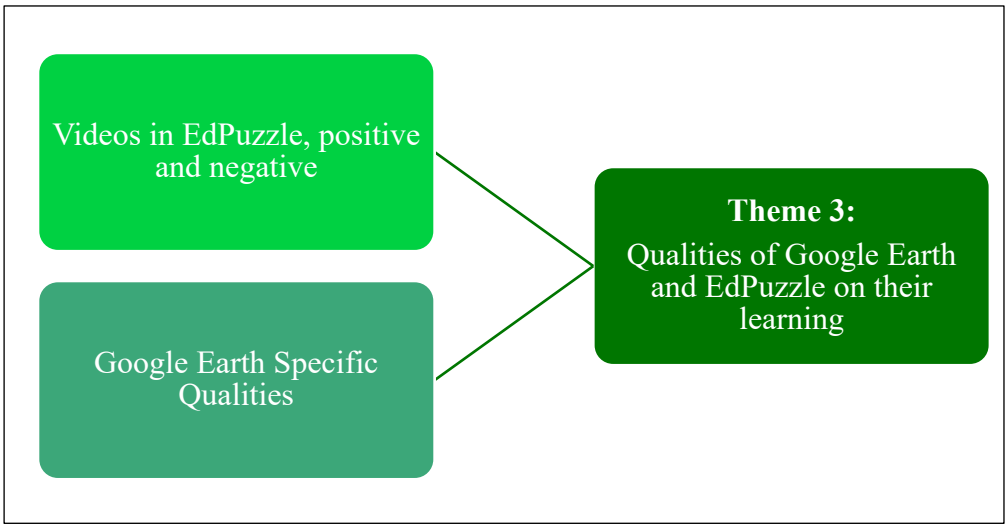


Figure 4.12 Categories within theme three.

Videos in EdPuzzle - positive and negatives. In this study, the category – Videos in EdPuzzle positive and negative – students shared their positive and negative opinions on the videos in EdPuzzle. From the four technologies into the map skills lesson of this

study, the video's embedded within EdPuzzle were spoken about specifically during the semi-structured interviews. The *In Vivo code* of "*remind you of the answer"* and combined with the *Process codes* of *rewatching*, *rewinding,* and *control your learning* supported how the students enjoyed watching the videos and answering questions on EdPuzzle. For example, students offered the following in their semi-structured interview responses:

> Cassidy: I love play backs and watch the video again.
>
> Dylan: If I wasn't paying attention to the video and it asks me a question it lets me click on rewatch.

These responses supported positively that the videos associated with EdPuzzle helped the students learning about different types of maps and the four hemispheres. This finding is supported by the research of Bursa and Cengelci Kose (2020) who also found that the integration of technology through EdPuzzle videos in a fifth grade social studies classroom resulted in improved students' learning.

Conversely, students with negative opinions on the EdPuzzle videos was also found within this category. This could be seen in the *In Vivo codes* "*didn't like the videos stopping"* and "*difficult to stop and answer questions"* as well as in the *Attribute codes* of *remembering was difficult*. For example, two students offered semi-structured interview responses of the following:

> Morgan: So almost like, you know, you're wanting to pay attention so you can get the question right.
>
> Charlie: I know what the questions say, but it's just hard for me to listen to the questions.

The student responses identified how the videos embedded within EdPuzzle did not support students learning about different types of maps and the four hemispheres.

The pattern found within the codes created, that led to the development of this category, showed the students positive and negative perceptions of the technology integrated into this map skills lesson. Even though EdPuzzle was the second favored technology tool used in this study, there were still both positive and negative opinions on the use of this tool. Not every student is going to like each tool and not every student is going to have the same opinion of the technology integrated; however, everyone's perspectives were considered during the processing of the codes. Analysis of these codes revealed the students had some positive as well as some negative opinions on the videos they watched using EdPuzzle while their learning about map skills. This category was developed out of only the subgroup Video, from which a total of 24 codes (see Figure 4.13).

Videos in EdPuzzle, positive and negatives
Video
remind you of the answer
difficult stop and answer questions
questions at the end
didn't like the videos stopping
pause
remembering
rewatching
rewinding
can't look back at video
control learning
questions during video
more information

Figure 4.13 Videos in EdPuzzle - positive and negative category.

Google Earth specific qualities. In this study, the category – Google Earth specific qualities – students identified qualities of using Google Earth in their learning about map skills. The specific qualities of Google Earth (e.g., dragging and search tool) that students preferred contributed to Google Earth being identified as the technology tool they favored to use when learning about map skills. The *In Vivo codes* of "*learn about new places"* and "*see the whole world"* combined with the *Process codes* of *exploring* and *investigating* supported how the students enjoyed exploring geographic areas using Google Earth. For example, students offered the following in their semi-structured interview responses:

> Peyton: And when we do the Google Earth, you can see the world by just scrolling around… I like on Google Earth, I like finding places and friends.
>
> Kennedy: I get to look up the houses and the schools.
>
> Peyton: I liked about it because you could learn about new places that you didn't like know before.
>
> Riley: Google Earth was enjoyable because I could look at other places in the world. I like to search up places, and then it's like on there and you had a little person in the middle. So then if you click a road you can look at it. I like if I wanted to go to Mexico I could use Google Earth to see where and what Mexico would look like before I went there.

From these responses, students enjoyed interacting with multiple features offered within Google Earth. This finding is supported by the research of Collins (2018) who also found that the integration of technology through Google Earth in an eighth grade geography

class resulted in students having more visualization and analytic opportunities in their learning.

When using specific aspects of Google Earth, another pattern found within the codes was how the students found Google Earth features to be easy or fun to use. This could be seen in the *In Vivo code* "*knowing where everything is"* as well as in the *Attribute codes* of *searching being easy* and *it took you to the answers*. For example, three students shared in the semi-structured interview responses:

> Charlie: I think I was working hard Google Earth because I, I know where everything is.
>
> Dylan: Once you get used to it, it kind of gets easy.
>
> Riley: All you had to do was just look up a place and then find it… could look at other places in the world.

The responses offered positive the students' perceptions on the use of Google Earth as a technology integration option for learning map skills. In this study, Google Earth was the favorite technology tool of the students by a vast majority; therefore, this tool could be incorporated into other social studies curriculum to help foster students' interest in what they are learning. This category subsumed the subgroups Exploration and Google Earth, from which a total of 16 codes were generated (see Figure 4.14).

Google Earth specific qualitites	
Exploration	
around the world	
see the whole world	
learn about new places	
finding places	
exploring	
places	
travel	
explore	
explporing	
travelling	
investigating	
Google Earth	
know where everything is	
searching	
know answers	

Figure 4.14 Google Earth specific qualities category.

Chapter Summary

For this action research study, quantitative and qualitative data were collected. The quantitative sources included 1) Map Skills Assessment (pre and post), 2) exit tickets, 3) Elementary Student Engagement Survey, and 4) Student Technology Perception Survey. The qualitative data included semi-structured student interviews and the researcher journal. From the quantitative sources, the students were found to perform better on the post Map Skills Assessment compared to the pre Map Skills Assessment. Additionally, the students were positive in their responses about each of the technology tools integrated into the map skills lesson. However, when asked specifically which tool was their favorite, Google Earth was chosen by 79% of the students. Three themes emerged from the qualitative data: 1) technology integration impacted behavioral, cognitive, and emotional engagement, 2) benefits and challenges of technology integration, and 3) the qualities of Google Earth and EdPuzzle on their learning. The

analysis of both the quantitative and qualitative data helped me understand the results of the study.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND LIMITATIONS

This chapter positions the findings with the literature on the effects of technology integration on academic performance and engagement. The purpose of this action research was to evaluate the impact of technology integration on third grade social studies students' academic performance and their engagement at Peony Elementary, answering the following research questions:

1. What is the impact of technology integration on third grade students' academic performance in social studies?
2. How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third-grade social studies classroom?
3. What are third grade social studies students' perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck to learn map skills?

Both quantitative data (e.g. Map Skills Assessment pre and post-test, exit tickets, Elementary Student Engagement Survey, and Student Technology Perception Survey) and qualitative data (e.g. semi-structured interviews and researcher journal) were collected and analyzed. Three themes emerged from the data analysis: 1) technology integration impacted behavioral, cognitive, and emotional engagement, 2) benefits and challenges of technology integration, and 3) the qualities of Google Earth and EdPuzzle on their learning. This chapter will share a) the discussion, b) the implications, and c) the

limitations of the study.

Discussion

The discussion section will connect the findings of this action research with the research questions. To answer the research questions, the quantitative and qualitative data were combined and considered through a lens of conceptual understanding. Buss and Zambo (2014) describe this part as complementarity of findings and "providing information about how the qualitative data support the quantitative data. If there is disconfirming evidence, this should also be discussed" (p. 67). The discussion is organized by the three research questions of this study.

Research Question 1: What is the impact of technology integration on third grade students' academic performance in social studies?

The focus of this research question was to examine the connection between technology integration and the academic performance of third grade social studies students. The definition of technology integration that best aligns with this study is "the process of making technological tools and services, such as computer systems and the Internet, a part of the educational environment – includes changes made to the curriculum as well as to educational facilities" (Consoli, Désiron, & Cattaneo, 2023, p. 2). In this study, there was a statistically significant change in the number of questions the students answered correctly on the post-test when compared to the number of questions the students answered correctly on the pre-test (pre-test $M = 9.91$, post-test $M = 18.43$). The impact of integrating four technologies, Google Earth, EdPuzzle, Jamboard and Pear Deck, was found in the improved post-test scores on the Map Skills Assessment. Çiftçi (2020) integrated technology into a 7th grade social studies classroom and found that

students' academic performance improved as a result of incorporating blended learning into the classroom. This study supports these findings showing that the students' map skill knowledge improved from the start compared to the end of the intervention. How a) technology integration and b) South Carolina state standards support the answer to *RQ1* is identified next.

Technology integration. Educational research on best pedagogical strategies for teaching map skills has shown critical thinking and problem solving, creativity and innovation, communication, and collaboration to enhance learning and innovation skills. Additionally, the pedagogical strategies of information literacy, media literacy, and ICT literacy information can enhance learning, media, and technology skills. In this study, students demonstrated problem solving skills by figuring out (with the help of the researcher) how to use the technology tools that they had some familiarity with from use in other academic subjects (Google Earth, EdPuzzle, Jamboard, and Pear Deck). Additionally, students used a variety of other technology tools such as watching videos and answering questions embedded throughout about the map skills unit and learned from the use of interactive slides. Flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility pedagogical strategies can also be used to enhance life and career skills (Farisi, 2016). Students in this study learned adaptability by participating in a learning strategy that might be different from what they were familiar. For example, the four technology tools incorporated in this study were different from the traditional lecture style of teaching social studies. Students had to take the initiative in their learning and were held accountable for their learning and participation. For example, if the students

did not pay attention when the EdPuzzle videos were playing, then it would show in their results by the questions answered incorrectly.

South Carolina state standards. The four learning objectives of this map skills unit were to utilize an alphanumeric grid to locate the continents and oceans, to locate the world's four hemispheres using the major components of latitude and longitude, and to identify the spatial hierarchy of political and physical geographic features. While there was growth in the students' knowledge in each of these objectives, the quantitative findings revealed the most improvement in student knowledge of standard 3.1.3.PR: Identify the spatial hierarchy of political and physical geographic features. The results on the pre-test showed that many students did not know anything about where they lived (e.g., the city, state, country, continent, or physical features of the area in which they live). The interactivity of the Pear Deck slides helped the students' understanding of where they lived and how each location got bigger and bigger when going from a city to the continent. This was shown in Peyton's semi-structured interview comment, "I liked how there was like a book, like it acted like you could zoom in or zoom out of the Earth." The quantitative findings revealed the students to show the least improvement in their knowledge of standard 3.1.2.AG: Locate the world's four hemispheres (i.e., northern, southern, eastern, and western) by using the major components of latitude and longitude (i.e., the Equator, the Prime Meridian, lines of latitude (i.e., parallels), lines of longitude (i.e., meridians), and the International Date Line. Having to learn and retain many new vocabulary words, such as Equator, Prime Meridian, latitude, and longitude, likely contributed to the students' struggles to learn these concepts. Three of the four technologies integrated into this map skills lesson were used to help the students succeed

in their knowledge of this standard. The students watched a video on EdPuzzle about the four hemispheres, completed a Jamboard activity identifying the lines of longitude, latitude, the equator, and Prime Meridian, and they found locations on Google Earth using lines of latitude and longitude. Having more time to practice identifying the different vocabulary terms might have better helped the students learn these concepts. The students' scores also did not improve much from the pre-test to the post-test on standard 3.1.1.AG: Utilize an alphanumeric grid to locate the continents and oceans. It should also be noted that many of the students already had a good understanding about the use of an alphanumeric grid on the pre-test, as evidenced by a higher percentage of students who answered those questions correctly. Jamboard provided opportunities for students to practice identifying a location using an alphanumeric grid, which when combined with the more straightforward approach offered to the students for learning where continents and oceans are located contributed to higher scores, both on the pre-test and on the post-test. The outcomes of this study support that technology integration had a positive impact on the third-grade students' academic performance in social studies, on their map skill knowledge.

Research Question 2: How does using technology affect students' behavioral engagement, cognitive engagement, and emotional engagement in a third-grade social studies classroom?

The focus of this research question was to examine the connection between technology integration and student engagement, specifically regarding students' behavioral, cognitive, and emotional engagement. Bond and Bedenlier (2019) found that "the integration of educational technology facilitates engagement if students find it

meaningful, related to real life, and can act without anxiety" (p. 8). There is a gap in the existing research on how meaningfulness, authentic learning, and anxiety is correlated with student engagement and technology integration regarding third grade students and the social studies curriculum. Johns et al. (2017) discussed the benefits of student engagement when implementing various forms of technology, including Seesaw, Educreations, Google Classroom, and Classtools.net into the elementary classroom. Johns et al.'s findings showed student engagement to have increased as well as student achievement. While the quantitative data of this study did not reveal any statistically significant findings, the qualitative data supported that integrating technology resulted in the students being more engaged and interested in what they were learning. How technology integration affected the third-grade students' behavioral engagement, cognitive engagement, and emotional engagement in this study is discussed next to further identify potential reasons for why there was a difference between the quantitative and qualitative data findings.

Behavioral engagement. Behavioral engagement is defined as the "conduct in class, participation in school related activities, and interest in academic tasks" (Hulsey, Moten, Hebda, Sulak, & Bagby, 2023, p. 13). Behavioral engagement in the classroom is often assessed through teacher observations (Parsons et al., 2018). In this action research study, the researcher's journal is where my observations of students' behavior were reported. When evaluating behavioral engagement indicators in the classroom, teachers look at student conduct, student participation in classroom and school activities, and student interest in academics such as being on task, paying attention, asking questions, and participating in class discussions (Parsons et al., 2018). Specifically, when evaluating

behavioral engagement with young students, Havik and Westergård (2020) found the time students spent on tasks, their demonstrating paying attention, a student asking questions in class, and a student participating in class discussions to be specific behaviors to look for. The design of EdPuzzle encourages the students to pay attention to the video as there are embedded questions throughout the lesson that they must answer to advance. I observed my students in this study to be paying attention more consistently while watching the videos. They also answered many of the embedded EdPuzzle questions throughout the video correctly. The improved post-test assessment scores could have contributed to the students' increased paying attention to the videos when the EdPuzzle technology was integrated into the lesson. Similarly, when Bursa and Cengelci Kose (2020) integrated the use of EdPuzzle into their fifth-grade classroom pedagogy to identify its impact on academic achievement, they found that the questions in EdPuzzle improved students' learning.

In analyzing both quantitative and qualitative data outcomes there was a slight discrepancy regarding students' behavioral engagement. While showing a tendency towards agreement, there was a slight decline in the students' responses on quantitative data sources regarding their perceptions about behavioral engagement. This discrepancy could be due to how each student was feeling on the days they took the survey; whether they were in positive or negative moods could have affected their answer choices. There was evidence in the qualitative findings to suggest there was more behavioral engagement occurring by the students at the end of the intervention compared to the beginning of the intervention. For example, there were five students identified in the observations recorded in my researcher's journal at the start of the intervention who

demonstrated off-task behavior, not asking questions, or not participating in class discussions. Whereas nearing the end of the intervention, there were fewer observation recordings for these same behavioral attributes and instead observations of on-task behavior, asking questions, and participating in class discussions were recorded for 10 students.

The research of Conner (2016) identified that students are engaged in their learning when they are interested in what they are learning. In this study, students preferred learning using their Chromebooks because everything was in color, it kept them interested, and it was fun. Most teachers view behavioral engagement as the most important form of engagement for students (Conner, 2016). Other studies also found there to be no correlation between behavioral engagement and a student's interest in what was being learned (Cevikbas & Kaiser, 2021; Egiebor & Foster, 2019; Parsons et al., 2018). Further supporting the existing research on behavioral engagement (Havik & Westergård, 2020; Parsons et al., 2018), this study concluded that higher levels of behavioral engagement can often be from positive interactions with their learning environment, which can then also show to have a positive impact on students' academic achievement.

The research of Minkkinen (2022) examined engagement with high school math students after integrating Pear Deck in their online learning course and found that the integration of Pear Deck increased student engagement. Likewise, Pear Deck was found to increase the engagement of my students in this study. Pear Deck offered students a variety of question types, which allowed for their different interests to be peaked and introduced a change in what they were doing from slide to slide. The variety of question

types, such as drag and drop and multiple choice questions, were found to keep the students interested in what they were doing. Alexander (2014) integrated technology using a storyboard within the social studies curriculum of a sixth-grade history class. Their findings showed when the digital storyboard was integrated into the curriculum, students demonstrated increased on task behaviors and showed a greater interest in the use of technology compared to the content; thus, behavioral engagement was increased.

Cognitive engagement. Cognitive engagement is defined as students using technology in various ways to interact with the learning content (Vongkulluksn, Lu, Nelson, & Xie, 2022). In this study the students used EdPuzzle to watch videos and answer questions about the different types of maps as well as the features of maps. They used Google Earth to explore different continents and oceans as well as lines of longitude, latitude, the Equator, and Prime Meridian. They used Jamboard to answer questions about alphanumeric grids and lines of longitude and latitude. They used Pear Deck's interactive slides to learn about continents and oceans as well as the physical features and city, state, country, and continent in which they live.

Conner (2016) defines cognitive engagement as incorporating "thoughtfulness and willingness to exert the effort necessary to comprehend complex ideas and master difficult skills" (p. 15). The students in this study had to be dedicated to their learning and adapt to a new learning technique (e.g., incorporating more technology into their learning), and they had to stay focused on their independent work as well as paying attention during the lesson. The students also showed improvement in their confidence as seen in the increase of their scores from the beginning of the data collection period to the end of the data collection period on the cognitive engagement questions from the Student

Engagement Survey. At the start of a unit, especially in third grade, students do not always have prior knowledge about what they are learning. However, by the end of the unit they had learned everything they needed to know for the unit. In this study the students increased their map skills knowledge. These findings are supported by Barlow (2019) who stated that cognitive engagement is conceptualized in the learning and instruction literature as the psychological investment students make towards learning – which ranges from memorization to the use of self-regulatory strategies to facilitate deep understanding. To increase cognitive engagement, students must move from shallow cognitive processing to meaningful cognitive processing (Walker et al., 2006). Cognitive engagement is unobservable as it involves latent constructs that cannot be directly measured (Hsueh et al., 2022). A more intentional approach that focuses on the measurement of related variables, such as strategic learning is a way to measure cognitive engagement (Fredericks et al., 2004; McCoach et al., 2013).

In converging the quantitative and qualitative data outcomes, there was an increase in the student's cognitive engagement from the start to the end of the intervention. While the students' agreed that their desire to learn was already elevated at the start of the intervention, the students offered a near "very true" response to those same cognitive engagement questions asked of them at the end of the intervention. Cognitive engagement was shown through the student actions observed and recorded in the researcher journal. For example, students were found to spend more time on-task and showed an interest in using the technology tools for learning about map skills, specifically alphanumeric grids. Further supporting the existing research on cognitive engagement (Wallace-Spurgin, 2019), this study concluded that higher levels of cognitive

engagement can have a positive effect on students' learning, specifically their learning of map skills. Consistent with Johns et al. (2017), both behavioral and cognitive engagement increased because the students became more active learners and thought more deeply about what they were learning. EdPuzzle was found to increased student cognitive engagement because students were watching videos and answering questions that were aligned to the video which is something that they rarely do in the classroom. This is very similar to watching YouTube videos, which is an activity that many of my students spent a lot of their time doing.

Emotional engagement. Emotional engagement can be either positive or negative feelings about the students' learning experience. Emotional engagement is defined as "positive and negative reactions to teachers, classmates, academics, and school and is presumed to create ties to an institution and influence willingness to do the work" (Conner, 2016, p. 14). Heemskerk and Malberg (2020) define emotional engagement as how much students like the subject that they are learning. Parsons et al. (2018) define emotional engagement as affective engagement which includes student interest, enjoyment, enthusiasm, and efficacy in their learning. In this study students stated that the learning process using integrated technology was fun, they were happy, excited about learning, they felt smart, they felt proud, and they were focused. Egiebor and Foster (2019) claimed that emotional engagement allows students to invest in their learning and can lead to positive academic outcomes. The students in this study showed enjoyment in their learning as seen in the findings of both quantitative and qualitative sources. In this study, students showed that they were less stressed or anxious when learning with technology because they could have their headphones on when listening to EdPuzzle

videos which helped keep them focused or not become distracted by other students. Also, students found their learning using technology to be meaningful. For example, when using Google Earth students could explore the world around them for both places they were familiar with as well as places they had never been to but may want to travel to one day.

The students' learning attitudes are an indication of their behavior in class and towards what they are learning, and teacher observations and student self-reporting surveys are ways to measure emotional engagement (Zee & Koomen, 2020). Since the observation of a student's emotion can be unreliable, researchers instead should observe how a student reacts to what is being learned (Barlow, 2019). Despite a few negative opinions, most students in this study had a positive reaction to incorporating technology into their learning about map skills in social studies.

There was no change in the quantitative data from the beginning of the intervention to the end about the students being at the midway point between neutral agreement to full agreement on their perceptions of emotional engagement. This aligns with the qualitative findings that showed that the students' perceptions of their emotional engagement were positive. Students greatly enjoyed using all four of the technology tools and found them "interesting," "entertaining," and "easy to use." Egiebor and Foster (2019) found that social studies could be made more interesting and relevant when teachers used different instructional strategies, technologies, and multimedia. The variety of technology tools such as videos with questions embedded and digital interactive slides with different question types such as multiple choice, short answer and drag and drop kept students interested in what they were learning. The students in this study enjoyed the

interactivity of technology, which is different from traditional instructional strategies. In this study, the students shared preferring to use their Chromebook for their learning. Enjoying the learning process helps keep students engaged.

Research Question 3: What are third grade social studies students' perceptions about using Google Earth, EdPuzzle, Jamboard, and Pear Deck to learn map skills?

The focus of this research question was to examine the connection among student perceptions about the integration of four technology tools Google Earth, EdPuzzle, Jamboard, and Pear Deck. I wanted to use technology tools that I was familiar with and that would be relatively easy for my students to use. Also, I chose tools that students have used in other classes for other academic disciplines but had not used when learning social studies. Both quantitative and qualitative data collection sources were used to understand the students' perceptions about each technology integrated into their learning map skills. While some students offered dissenting opinions, most of the students had positive opinions about each of the technology tools used. This will look at the four technology tools (Google Earth, EdPuzzle, Jamboard, Pear Deck) to show the students' perceptions of each technology tool aligned with what is reported in the existing literature.

Google Earth. Google Earth is a platform launched by Google that uses a virtual reality design to identify features of any location found on Earth. In this study, the students used Google Earth by searching for various locations around the world, such as our city, state, and country, as well as the continents and oceans. Alajmi and Al-Hadiah (2017) define Google Earth as an application that uses satellites via the Internet Network to provide 3D aerial images. These images represent the Earth's environment to investigate the natural landscape and to determine the locations in the world.

The converged data source findings of this study showed that students identified Google Earth as their favorite technology tool. There was a question on the Student Technology Perceptions Survey that specifically asked the students to identify which of the four technology tools used in their learning map skills did they like the most, and 79% of the students marked Google Earth as their favorite technology tool. This could be because students felt that they had some control over their learning and that they were able to explore and investigate any location on earth. According to the student interviews, some of the students enjoyed the features of Google Earth because they could explore and zoom into the places that they were learning about. Collins (2018) found eighth grade social studies students to use the ruler and the zoom tools the most when using Google Earth. The students in this study enjoyed being able to zoom in and out of the earth and find new continents and oceans. They could almost pretend they were there. Additionally, Collins found the integration of technology resulted in students stating that it was easy to answer questions digitally and that digital maps helped improve their thinking skills. The findings of Collins, as well as Zhao et al. (2021), were similar to the qualitative data responses found in this study where my students thought that the use of Google Earth was "easy." My students also enjoyed being able to "travel to" new places when using Google Earth. For example, Charlie said, "Google Earth was entertaining, it helped." Britt and Lafonttaine (2009) found that students felt they were able to fly to places or landforms that they wanted to see or learn more about. Collins also found that their eighth-grade social studies students gained good spatial thinking skills since they were able to move around and change the orientation and scale of Earth. This was supported by other research that also found Google Earth helped students with 3D visualizing and spatial

patterns and awareness (Britt & Lafontaine, 2009; De Paor et al., 2017; Patterson, 2007). Mejia Avila, Sanchez Agamez, and Soto Berrera (2021) reported Google Earth to be intuitive and user-friendly, which aligns with Morgan and Taylor's perceptions in this study who said that Google Earth was "simple," "choosing answers was easy," and that they knew where everything was.

EdPuzzle. EdPuzzle is a website where you can watch instructional videos that stop and ask questions throughout the video. Kaczorowski, Kroesch, White, and Lanning (2019) described EdPuzzle as a free tool where educators can post video lessons with questions and prompts embedded in them. The students in this study watched various EdPuzzle videos on map skills and answered questions embedded throughout the video.

When converging the findings from the quantitative and qualitative data sources of this study, it showed there were mixed student perceptions about their use of EdPuzzle. This could be due to students having different learning styles, some are more visual learners while others are not. The last question of the Student Technology Perceptions Survey asked students to identify their favorite technology tools used in their learning about map skills. EdPuzzle was indicated as the second favorite technology tool with 14% of the students marking EdPuzzle as their favorite technology tool. In addition, 93% of students stated that they found it interesting using EdPuzzle in their learning. Riley said, "[It is] just more fun to watch a video" when referring to the EdPuzzle activities. Jaswati, Destiana and Wijayanti (2023) found that students who were digitally literate were enthusiastic about their learning and thought that learning social studies was fun and useful for everyday life when using tools like EdPuzzle. This confirms what students in this study said about their enjoyment using EdPuzzle.

Cassidy and Dylan reported in their semi-structured interviews to liking EdPuzzle because they could "rewind" and "rewatch" the videos, suggesting that they could control the pace of their learning. I think that many students liked to be in control of their learning. This aspect of EdPuzzle benefitted students and their different learning paces that they learn at. According to Kaczorowski et al. (2019) and Eng (2017), EdPuzzle also facilitates engagement because students are unable to fast forward through the video, and the platform pauses the video if a student tries to click off the webpage. For this research, students exhibiting behavioral engagement was easy to observe through their being on task while watching the video and answering the questions prompted by EdPuzzle. Cognitive engagement was observed through student's memorization and understanding of what they watched. Emotional engagement was shown through the students having a positive attitude when using EdPuzzle. Jaswati et al. (2023) also found that students were more curious about the content that they were learning when they used unconventional learning models such as EdPuzzle.

There were some students who shared they did not like the features of EdPuzzle. In the semi-structured interviews of this study, some students said that they did not like that there were multiple questions embedded into the videos because they didn't like that the video kept stopping and just wanted the "questions at the end." This contradicts the research of Kaczorowski et al. (2019) and Eng (2017), who found the opposite to be true; most users prefer that the questions are embedded throughout the video.

Jamboard. Jamboard is a Google platform which allows users to collaborate their learning by creating digital sticky notes. There is a gap in the existing research where Jamboard has been studied in elementary schools or with social studies curriculum. Ortiz-

Leger (2022) defines Jamboard as an online interactive whiteboard that allows educators and students to collaborate and share in real-time. Students and educators can use the sticky notes feature to share ideas collectively. Hunt, Marino, Bentley, and Banzon (2022) assert that in Jamboard "students can use plain text, sticky notes, and shapes to explain their thought processes" (p. 93). Students were given a variety of ways when using Jamboard to share and show their learning. They could use the tools and strategies that work best for them. Students of this study were observed most often to create sticky notes, using a color of their choice for the note, to answer questions on Jamboard about map skills.

The converged data source findings of this study showed that Jamboard was the students' least favorite technology tool. The outcomes of the Student Technology Perceptions Survey revealed no students chose Jamboard as their favorite technology tool. I believe that this is because Jamboard was not as interactive as the other tools used or because I did not incorporate videos like was done with EdPuzzle. Jamboard was more of a simple activity where students responded to a question that other students could see the answer to. While Hunt et al. (2022) found that providing students with different ways to show their learning can improve student motivation and engagement, these kinds of findings did not prevail in this study.

Pear Deck. Liu et al. (2003) define Pear Deck as an interactive response system, or a technology-enabled learning environment that improves student engagement. Anggoro and Khasanah (2022) identified that Pear Deck allows for both synchronous and asynchronous learning. Minkkinen (2022) describes Pear Deck as a Google add-on that allows teachers to build in interactive activities such as polling, text, and drawing features

to existing Google slides. It should be noted that to date there is a lack of research studies using Pear Deck in elementary schools and social studies curriculum. The participants of this study answered various questions on Pear Deck about map skills, including the multiple choice and drag and draw question designs.

The converged data source findings of this study showed that students had mixed opinions on Pear Deck. While 100% of students liked using Pear Deck for learning about map skills, only 7% of students said that Pear Deck was their favorite tool out of the four technology tools used. Students shared in their semi-structured interviews that they enjoyed having “multiple things to do" with the different types of questions. For example, Morgan said, “It was easy to drag something.” Specifically, I observed the students to be more engaged throughout the activity when using Pear Deck, and they were answering questions using the drag and draw feature.

Implications

This research has implications for me personally, for elementary classroom practitioners, and for scholarly practitioners considering research using technology integration with third grade students. Three types of implications are considered: (a) personal implications, (b) professional implications, and (c) implications for future research.

Personal Implications

An unexpected finding from the qualitative results of this study was an uneven distribution in the students’ interview comments about the tools used. The preponderance of the students' comments from the semi-structured interviews focused on Google Earth and how much the students enjoyed using Google Earth. As previously identified from

both quantitative and qualitative data outcomes, the students preferred using Google Earth the most. While the lack of distribution in comments can be suggested from the converged data outcomes offered above regarding Google Earth, I was still expecting the students to offer commentary about the other tools in more detail than was shared in their interviews.

Another unexpected result was students not liking the feature of EdPuzzle where it kept stopping or pausing to ask them questions. I thought that they would have liked the break in the video so that they only had to focus on sections of the video at a time, not the whole video. It was concluded from the qualitative data that what the students did not like was that they had to pay attention throughout the whole video because it did stop for them to answer a question. As one student said in a semi-structured interview response, "it made me look at the computer and pay attention." The outcomes from this study about this feature of EdPuzzle contradict other research that has reported a popular aspect of EdPuzzle is the fact that questions can be embedded throughout the video (Eng, 2017; Jaswati et al., 2023; Kaczorowski et al., 2019). Additionally, I was surprised by how many of the students thought the Pear Deck tools were tricky to use. While I thought they would enjoy the drag and draw question design, many shared finding the drag and draw question design difficult.

The hope for this study was that students learning on their Chromebooks would help reduce external classroom distractions. I observed prior to this study when using paper and pencil classwork that many students would distract other students. A study conducted by Chen and Lin (2017) found that the integration of technology decreased students' distractions in class. During this intervention, with the technology integrated

onto the students' Chromebooks, the frequency of students observed to distract other students did not improve much, if at all. This supports the existing research that shows distractibility and students' lack of paying attention impact their learning in the classroom (Havik & Westergård, 2020; Husni et al., 2022).

Professional Implications

An implication regarding technology integration is evaluating how researchers, teachers, and administrators know if the technology is being integrated effectively (Hechter & Vermette, 2013). Educators and administrators are always being bombarded with the newest fad in technology. Incorporating professional development that centers around best practices about technology would be a great way to ensure educators and administrators are integrating technology effectively and not just using the technology tool most talked about. Being able to determine the best technology tool to use for a specific age and subject is also a very difficult task for educators since there are so many programs available. Murray and Rabiner (2014) found that "identifying specific evidence-based programs and matching them to student needs may be challenging for educators given the wide range of programs that are commercially available and the increasing number of studies that may appear conflicting or are difficult to interpret" (p. 60). This is where many educators and administrators will have to use trial and error and see what works best for them and their students.

Another implication regarding technology integration is determining how teachers will be able to monitor and support students' use of technology. Murray and Rabiner (2014) discussed how adult assistance is often necessary to ensure that students understand the directions and work effectively. With larger student-to-teacher ratios, it is

often difficult for teachers to ensure that students are correctly and effectively using the new technology integrated into the curriculum. Technology can help with engagement by offering immediate and consistent feedback as well as making connections to real-world contexts (Murray & Rabiner, 2014). To ensure student engagement, it is critical that educators provide "ongoing support to enable students' actual use of technology" and ensure "instructor presence throughout the course" (Bond & Bedenlier, 2019, p. 8). Teachers' involvement and how effectively the students are using the technology can help keep students engaged.

Implications for Future Research

The findings of this study offers implications for future research. Educators who are looking to implement technology in their classroom may also be interested in future research similar to this study. Future research should include ways of getting valid responses out of third graders, whether the responses are sought from an interview or a survey. In this study the students' responses for the interviews were very limited, and the students did not elaborate on their thoughts. Understanding the cognitive abilities of a third-grade student and using data collection sources that offer responses in the form of something other than words (e.g., use of emoji faces) is suggested for survey type instruments. Triangulating qualitative data to search for convergence among multiple and different sources (Creswell & Miller, 2000) is one way to gain rich descriptive outcomes from a third-grade student perspective. Recreating this study with older students, such as middle school students, might also result in interview responses of greater depth.

There is very limited existing research in three areas of this study, integrating technology in elementary grade social studies classes as well as research where Jamboard

and Pear Deck are the independent variables. Building off this study, future research is suggested using any social studies topic covered during third grade. While technology integration is not uncommon in other subjects, if technology is being integrated in social studies, there was scant research found for this study. Jamboard is still in its infancy in deployment; therefore, it is a relatively new technology tool for research to be conducted about its effectiveness on student engagement and academic performance. Although Pear Deck was founded in 2014 and has received many educational technologies tool accolades, there were no research studies found where Pear Deck was an independent variable of the research. Future research using both Jamboard and Pear Deck is recommended, using a span of ages, grades, and disciplines.

Limitations

There are limitations for this action research that should be noted. Action research is designed to answer a specific problem of practice (Mertler, 2017). While this study did reveal answers to the specific issue of technology integration and its impact on student learning of social studies, a limitation of this action research study was the small population size. I chose to use only one class of students; however, of the 29 potential students, only 14 parents offered consent for their child to be a research participant. The small number of students affected the reliability of the study. A study conducted by Kaur, Koval, and Chaney (2017) had a small sample size for their study and claimed that this could not be used to generalize the results of the study and recommended future research to utilize a larger population. There was also no control group in this study to which to compare the data.

Another limitation of the study is a typical third grade students' cognitive abilities. Third grade students range in age between 8 and 9 years old (occasionally 10 years old if they have been retained). In this study, there were eight students aged 8 and six students aged 9. At Peony Elementary where the study took place, there are many students who are underperforming. As an indication of under-performance of the participants of this study, three students had an IEP for learning disabilities. This factor combined with the students' age underscores how a third-grade student's cognitive abilities are a limitation of the study. Compared to adult participants or even older students, third graders are not going to be as eloquent or as detailed in their responses. For example, in the semi-structured interviews that were conducted, an older participant would be able to better explain the why behind their answer better than a third grader did.

Finally, third grader student's desire to please their teacher is also a limitation of this study. Many students have a desire to please their teacher, and a lot of times this can be done by telling the teacher what they believe they want to hear. For example, there were seven students who were observed in my researchers journal to demonstrate teacher pleasing behaviors as evident by their desire to complete all their work and stay on task during their independent work time. The desire to please the teacher, as a limitation of this study, could have affected students' honesty with their responses to both the surveys as well as the semi-structured interviews.

Conclusion

Improving student academic performance and engagement has always been a goal of mine and something that educators are always looking to find new ways to improve. The purpose of this study was to evaluate the impact of technology integration on third

grade social studies students' academic performance and their engagement with the map skills content at Peony Elementary. Google Earth, EdPuzzle, Jamboard and Pear Deck were implemented into a third grade social studies class to see the impacts of technology integration on academic performance and engagement on the third grade students. The students were positive in their responses about each of the technology tools integrated into the map skills lessons, and the findings revealed that the students most favored Google Earth. The quantitative sources revealed that the students performed better on the post Map Skills Assessment compared to the pre Map Skills Assessment. Three themes were identified from the qualitative data: 1) technology integration impacted behavioral, cognitive, and emotional engagement, 2) benefits and challenges of technology integration, and 3) the qualities of Google Earth and EdPuzzle on their learning.

With the increased use of technology in society, especially after the recent COVID-19 pandemic, many educators are using technology more in the classroom. Technology can be incorporated into classrooms in various subjects and through various tools to help with students' learning. Technology can be used not only in the social studies classroom but in any subject area. Students are using more technology than ever before, and more jobs are using technology than ever before. We need to prepare students for an increasingly digital world.

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APPENDIX A

INNOVATION TEACHING PLAN

Day	Lesson	Unit of Study	Standards
Day 1	Map Skills Pre-assessment		3.1.1.AG 3.1.2.AG 3.1.3.PR
Day 2	**I can statement:** I can identify and explain what maps are globes are. **Activating Strategy:** The class will watch the video about maps and globes on the PowerPoint page 21. **Teaching Strategy:** The teacher will use the PowerPoint page 19 to teach/introduce maps. TSW complete the interactive notebook notes. **Summarizing Activity:** The students will watch an EdPuzzle video about what maps are and will answer questions about maps. The students will also complete an exit ticket about their opinions on the use of EdPuzzle.	Unit 1	3.1.1.AG
Day 3	**I can statement:** I can identify the features of a map when given a map. **Activating Strategy:** The class will use a map on google maps or Social Studies Weekly Unit 1 Reading maps. The teacher will not read it yet, but the class will look at the map and discuss what they observe (e.g., compass rose etc.) **Teaching Strategy:** The teacher will use the slideshow to teach about the features of maps. The teacher will use the PowerPoint page 26 to teach how to read maps and some of the key features of a map (title, legend, compass rose). Students will fill out their foldables on map features. **Summarizing Activity:** The students will answer questions on a Jamboard, such as "What is the compass rose and what do you use it for?" The students will also complete an exit ticket about their opinions on the use of Jamboard.	Unit 1	3.1.1.AG

Day 4	**I can statement:** I can use the features of a map to create a map. **Activating Strategy:** The class will review the map features from the day before. **Teaching Strategy:** The teacher will use the google slides to review the map features. While the teacher is going through the google slides the students will be filling out their notes from page 26. **Summarizing Activity:** The students will create their own map page 27 with their own map key.	Unit 1	3.1.1.AG
Day 5	**I can statement:** I can identify and explain different types of maps. **Activating Strategy:** The class will review the different features of a map. **Teaching Strategy:** The teacher will use the google slides to introduce the different types of maps - today will be physical and topographic. The students will complete their notes for each map pages 16 and 17. **Summarizing Activity:** The students will use Google Earth and their knowledge of physical and topographic maps to locate different physical features throughout the world. The students will also complete an exit ticket about their opinions on the use of Google Earth.	Unit 1	3.1.1.AG
Day 6	**I can statement:** I can identify and explain different types of maps. **Activating Strategy:** The class will review physical and topographic maps. **Teaching Strategy:** The teacher will use the google slides to introduce the different types of maps - today will be political and road. The students will complete their notes for each map pages 16 and 17. **Summarizing Activity:** The students will use Google Earth to locate various continents, countries, cities as well as major roads and roads that they are familiar with, such as where they live and where their school is. The students will also complete an exit ticket about their opinions on the use of Google Earth.	Unit 1	3.1.1.AG
Day 7	**I can statement:** I can identify and explain different types of maps. **Activating Strategy:** The class will review political and road maps. **Teaching Strategy:** The teacher will use the google slides to introduce the different types of maps - today will be climate and resource. The	Unit 1	3.1.1.AG

	students will complete their notes for each map pages 16 and 17. **Summarizing Activity:** The students will watch EdPuzzle videos about climate maps and resource maps. They will answer questions about what information these maps show and why we would use them. The students will also complete an exit ticket about their opinions on the use of EdPuzzle.		
Day 8	**I can statement:** I can determine which type of map when given a map. **Activating Strategy:** The class will review the different types of maps. **Teaching Strategy:** The teacher will use the google slides to review/practice the types of maps for the quiz. The class will complete the notes with this page 15. **Summarizing Activity:** The students complete the quiz.	Unit 1	3.1.1.AG
Day 9	**I can statement:** I can identify the continents and oceans. **Activating Strategy:** Give students a blank world map and see how many continents and oceans they can label. **Teaching Strategy:** Teach the continents and oceans song using the PowerPoint page 3-15. The class will watch the continents video. Students will complete the backpack around the world activity as they travel to each continent and ocean. **Summarizing Activity:** The students will use Google Earth to locate the various continents and oceans. The students will also play Guess the Continent and Ocean. The students will also complete an exit ticket about their opinions on the use of Google Earth.	Unit 2	3.1.1.AG
Day 10	**I can statement:** I can identify the continents. **Activating Strategy:** The class will review what they have learned about continents and oceans. **Teaching Strategy:** The teacher will use the google slides to review continents. The students will complete the notes while the teacher is going through the slides page 36. **Summarizing Activity:** The students will use Pear Deck and match the continents on the map. The students will also complete an exit ticket about their opinions on the use of Pear Deck.	Unit 2	3.1.1.AG
Day 11	**I can statement:** I can identify continents and oceans.	Unit 2	3.1.1.AG

	Activating Strategy: The class will review what they have learned about continents and oceans. **Teaching Strategy:** The teacher will use the google slides to review continents. The students will complete the notes while the teacher is going through the slides page 42. **Summarizing Activity:** The students will use Pear Deck and match the continents and oceans on the map. The students will also complete an exit ticket about their opinions on the use of Pear Deck.		
Day 12	**I can statement:** I can identify continents and oceans. **Activating Strategy:** The students will play the continents and oceans game to review for their quiz. **Teaching Strategy:** The teacher will review any misconceptions from the game page 16-18. If there is time the class can also play the Kahoot (or this can be done instead of the game). Review the continents and oceans with the Kahoot game. **Summarizing Activity:** The students will complete the quiz.	Unit 2	3.1.1.AG
Day 13	**I can statement:** I can use an alphanumeric grid. **Activating Strategy:** The class will watch a video about using alphanumeric grids. **Teaching Strategy:** The teacher will use the google slides to teach about alphanumeric grids. The students will complete the notes at the same time page 31. **Summarizing Activity:** The students will follow the directions to create an alphanumeric grid page 32. The students can also answer the question in their interactive notebook page 34.	Unit 2	3.1.1.AG
Day 14	**I can statement:** I can use an alphanumeric grid. **Activating Strategy:** Grid Puzzle (The students will assemble grids with a partner and then ask each other questions.) **Teaching Strategy:** The teacher will use the PowerPoint pages 46-55 review and model how to read an alphanumeric grid. Students will rotate to alphanumeric grid stations to practice reading different grids. **Summarizing Activity:** The students will be given a Jamboard question where they will have to explain how to use an alphanumeric grid and they will have to identify locations using the alphanumeric grid. The students will also complete	Unit 2	3.1.1.AG

	an exit ticket about their opinions on the use of Jamboard.		
Day 15	**I can statement:** I can use an alphanumeric grid. **Activating Strategy:** The class will review how to read alphanumeric grids. **Teaching Strategy:** The teacher will clarify any questions/confusion. **Summarizing Activity:** The class will complete the alphanumeric quiz for a minor grade.	Unit 2	3.1.1.AG
Day 16	**I can statement:** I can name the four hemispheres when looking at a map. **Activating Strategy:** The class will watch the hemispheres video on the PowerPoint. **Teaching Strategy:** The teacher will use the PowerPoint page 62-84. The class will use an orange to teach about the hemispheres. The students will draw on the orange with a Sharpie and label the parts. The students will color and label their hemisphere notebook print outs as they explore the orange. **Summarizing Activity:** The students will watch an EdPuzzle video and answer the questions about the hemispheres. The students will also complete an exit ticket about their opinions on the use of EdPuzzle.	Unit 3	3.1.2.AG
Day 17	**I can statement:** I can explain what latitude and longitude are. **Activating Strategy:** The class will sing/listen to the Latitude and Longitude song in the PowerPoint. **Teaching Strategy:** The class will watch the Latitude and Longitude Brain Pop Video. The students will complete the A-E-I-O-U strategy on handout as they watch the video page 85-94. The students will take Latitude and Longitude notes from slideshow. **Summarizing Activity:** The students will answer questions on Jamboard about what they have learned about lines of latitude and longitude. The students will also complete an exit ticket about their opinions on the use of Jamboard.	Unit 3	3.1.2.AG
Day 18	**I can statement:** I can explain how to use latitude and longitude to find locations around the world. **Activating Strategy:** The class will identify the mystery location on the map on the PowerPoint page 95. **Teaching Strategy:** The students will go on a Latitude and Longitude Scavenger Hunt to locate different places. The students will take the first	Unit 3	3.1.2.AG

	letter of each place to unscramble a mystery phrase. The teacher will use the PowerPoint page 95-98. **Summarizing Activity:** The students will use Google Earth to find locations using lines of longitude and latitude. The students will complete the exit ticket about their opinions on the use of Google Earth.		
Day 19	**I can statement:** I can identify where I live in the world (city, state, country, continent). **Activating Strategy:** The teacher will read the book Me on a Map. **Teaching Strategy:** The teacher will use the slides to review where we live. The teacher will also go through the landforms that are in our region. **Summarizing Activity:** The class will use Pear Deck and Google Earth to identify each location of where they live e.g., our city→ SC → USA → North America. The class will also add the landforms that are in our region. The students will also complete the exit ticket about their opinions of the use of Pear Deck.	Unit 4	3.1.3.PR
Day 20	TCW review for the test using Kahoot		3.1.1.AG 3.1.2.AG 3.1.3.PR
Day 21	**Assessment**		3.1.1.AG 3.1.2.AG 3.1.3.PR

APPENDIX B

PRE- AND POST- MAP SKILLS ASSESSMENT

Unit 1: Map Skills Assessment

Name:_____ Date:_____

Which type of map is being described? : political, physical, topographic, resource/economic, road, or climate?

1. A map that shows the average rainfall in the country of Chile.
_____

2. A map that shows the elevation of Paris Mountain with labeled lines.
_____

3. A map that shows the major and minor roads of Vancouver.
_____

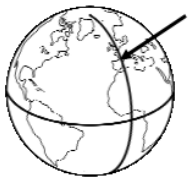
4. A map that shows the resources and goods sold from Japan. _____

5. A map that shows the boundaries of the countries in Africa. _____

6. A map that shows the ranges of elevation by colors and labels the mountain ranges of Europe. _____

Label each of these as: **latitude, longitude, equator, hemisphere, prime meridian**

_____



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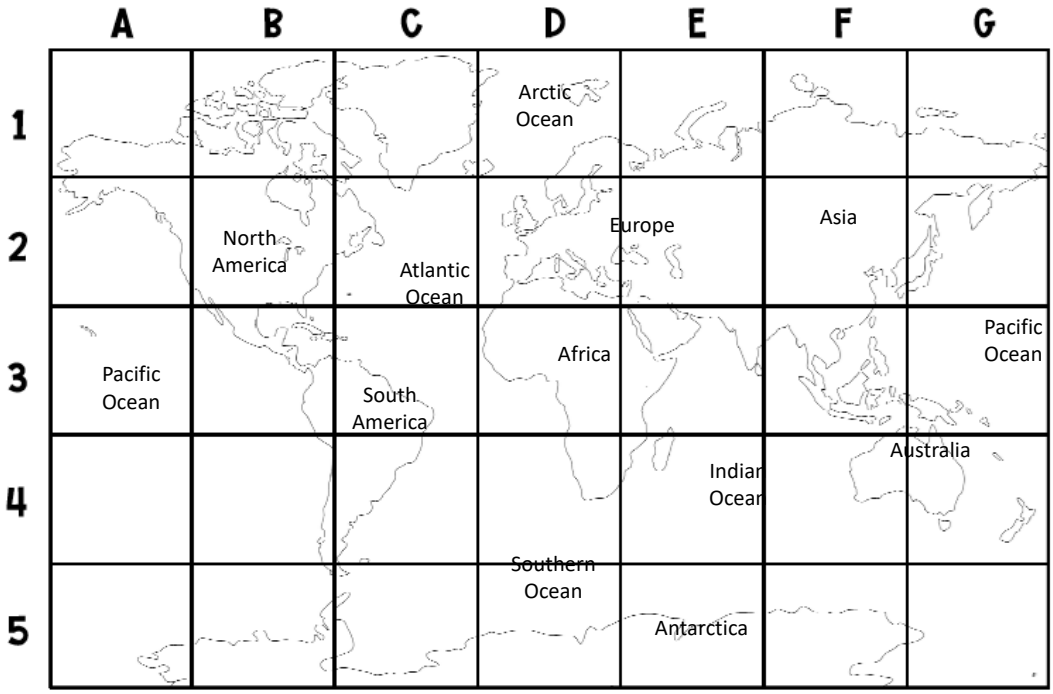


12. Which continent would I be on if I were at F2?

_____

13. If I were at location A4, which ocean would I be at?

_____

14. If I were at location B2, which continent would I be at?

_____

15. Which ocean is at C2? _____

16. F4 and G4 cover most of the continent of _____.

17. Which continent makes up most of D2? _____

18. Use a red crayon to draw the equator on the map.

19. Use a blue crayon to draw the prime meridian on the map.

20. . What do you call a person who makes maps?

_____

Answer the questions about where we live:

21. Which **continent** do you live on?

a. Greenville b. South Carolina

c. North America d. United States of America

22. Which **country** do you live in?

a. Greenville b. South Carolina

c. North America d. United States of America

23. Which **state** do you live in?

a. Greenville b. South Carolina

c. North America d. United States of America

24. Which **city** do you live in?

a. Greenville b. South Carolina

c. North America d. United States of America

25. Which ocean is to the east of us?

a. Pacific Ocean b. Atlantic Ocean

c. Southern Ocean d. Indian Ocean

26. What mountain range is to the northwest of us?

a. Blueridge mountains b. Rocky mountains

c. Himalayas d. Alps

27. Label the cardinal directions on the compass rose (4 points)

APPENDIX C

ELEMENTARY STUDENT ENGAGEMENT SURVEY

I want to understand how you feel about learning and school so that I can provide you and other students with the support needed to be successful. Please answer these questions as honestly as you can.

Student Name:

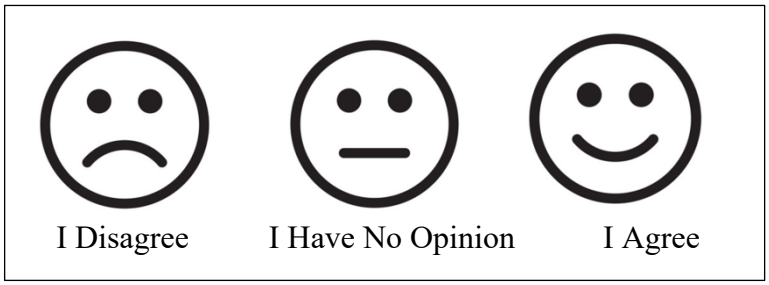
_____

Age: _____ **Grade**: _____ **Gender:** ☐ Male ☐ Female ☐ Other ☐ I'd prefer not to answer

Race (check all that apply):

- ☐ American Indian/Alaska Native
- ☐ Asian
- ☐ Hispanic
- ☐ Native Hawaiian/Pacific Islander
- ☐ Black/African American
- ☐ White
- ☐ Other
- ☐ Two or more races
- ☐ I'd prefer not to answer

Please respond to the following questions based on your experience with learning in the <u>last 20 days</u>. Mark one response only.



1. When I can, I join in/take part in class activities.

2. I set goals related to my schoolwork and try to reach them.

3. I try hard to do well in school.

4. I work hard on all classwork and assignments.

5. I am interested in at least one thing that I am learning in school.

6. I like learning new things in school.

7. School is important to me.

8. I am comfortable asking my teachers or other adults for help with my schoolwork.

9. I have friends at school that support and care about me.

Scoring Instructions

This section summarizes AIR's recommended approach to scoring the survey items for the Student Engagement Surveys (Version 1.0). This is Version 1.0 in an iterative development process. As we learn more about the surveys' use as measurement tools, we will revise them based on feedback and reviewed data.

The accompanying Student Engagement Survey Results Tools calculate student-level scores and produces aggregate charts of survey results (overall, by subgroup, and over time); for more information about the tools, go to **Tools for Schools** at communitiesinschools.org/k12/.

Response Values

All engagement items have four response options. Each response option is assigned a numeric value; more positive responses receive higher numeric values compared with less positive responses, as specified below. Only one response is permitted per item. Responses should be coded as follows:

- Strongly agree (value of 4) [Not included for this study]
- Agree (value of 3)
- Disagree (value of 2)
- Strongly disagree (value of 1)

Identifying Which Items to Include in Each Domain

Items are grouped by domain under the appropriate headers. Items to include in each of the four domains are listed below:

- **Behavioral Engagement**: items 1 - 4
- **Cognitive Engagement:** items 5–7
- **Emotional Engagement**: items 8–9

Calculating the Global and Domain Scores for Engagement

The process AIR proposes for calculating the Global Engagement Scores and domain scores involves using item means as described next.

- **Within each domain, calculate the average numeric value for the student or parent/guardian's responses to the items.** For example, for Behavioral Engagement, there are four items; a student who answered *agree* (value of 3), *disagree* (value of 1), *agree* (value of 3), and *neutral* (value of 2) would have an Emotional Engagement domain average of 2.25. *Note: For any skipped item, do not include that item in the calculation.*
- **Then, average the domain averages to obtain the Global Engagement Score.** The scores will range from 1 to 3.

To examine engagement levels in aggregate (i.e., for a group of students), average individuals' scores within areas of interest (e.g., Global Engagement, Emotional Engagement, etc.). Alternatively, review the distribution of scores across categories (e.g., XX% of scores were Higher Global Engagement). See the next section for more information about score categories.

Categorizing Engagement Scores

Because of the low number of items for each domain and the preliminary understanding of the measurement properties of the set of items, we have proposed thresholds for "higher" and "lower" on each domain and for Global Engagement, based on the range of possible scores. These scores can be used to understand the needs of individual students and students in aggregate and inform broader supports for the school community. We propose to flag scores only at the lowest and highest ends of the distribution because (prior to further examination of the data) information is too limited to make distinctions for scores in the middle of the distribution.

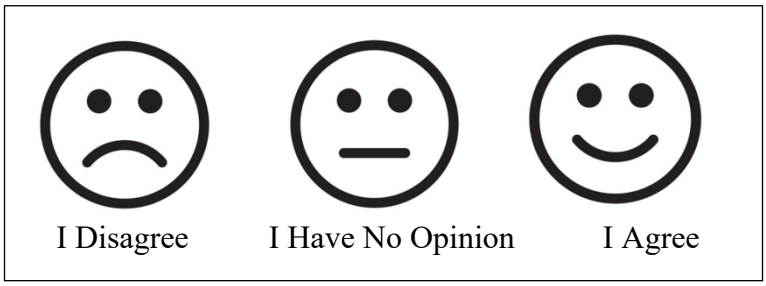
- **Higher:** Scores equal to or greater than 3.5
- **Lower:** Scores equal to or less than 1.5

"Lower" scores should then be categorized as "Lower [domain]," such as "Lower Global Engagement" or "Lower Emotional Engagement." "Higher" scores should then be categorized as "Higher [domain]," such as "Higher Global Engagement" or "Higher Emotional Engagement." For practical purposes, scores that are not in these categories can be labeled as "Moderate [domain]," such as "Moderate Global Engagement" or "Moderate Emotional Engagement." As previously noted, as we learn more about the measurement properties of these items, we will release updated guidelines regarding thresholds for "lower," "moderate," and "higher" categories. Note that the domain categorizations are domain-specific, meaning scores can be "lower" or "higher" in one domain, but not others.

APPENDIX D

STUDENT TECHNOLOGY PERCEPTIONS SURVEY

Read each statement and put an X over the face to answer how you feel about the statement



1. Because I used Google Earth, EdPuzzle, Jamboard and Pear Deck, I have a better idea of what to expect on exams, quizzes, or assignments.

2. Using Google Earth, EdPuzzle, Jamboard and Pear Deck helped me learn Social Studies material better.

3. Using Google Earth, EdPuzzle, Jamboard and Pear Deck motivated me.

4. Because I used Google Earth, EdPuzzle, Jamboard and Pear Deck, I was more engaged in class than I otherwise would be.

5. If we had not used Google Earth, EdPuzzle, Jamboard and Pear Deck, I would be less interested in what we learned about map skills.

6. Because I used Google Earth, EdPuzzle, Jamboard and Pear Deck, I participated more in class.

7. Using Google Earth, EdPuzzle, Jamboard and Pear Deck helped me focus on what I was learning.

8. When learning map skills using Google Earth, EdPuzzle, Jamboard and Pear Deck, I felt:

Happy	Yes ☐	No ☐
Excited about learning	Yes ☐	No ☐
Successful	Yes ☐	No ☐
Smart	Yes ☐	No ☐
Confused	Yes ☐	No ☐
Proud	Yes ☐	No ☐
Focused	Yes ☐	No ☐
Bored	Yes ☐	No ☐
Angry	Yes ☐	No ☐

9. Because I used Google Earth, EdPuzzle, Jamboard and Pear Deck, I am more aware of how I am performing in class.

10. I would like to use Google Earth, EdPuzzle, Jamboard and Pear Deck again in this Social Studies class.

11. I would like to use Google Earth, EdPuzzle, Jamboard and Pear Deck in other classes.

12. I wish we spent more time using Google Earth, EdPuzzle, Jamboard and Pear Deck.

13.

Using Google Earth was fun	Yes ☐	No ☐
Using EdPuzzle was fun	Yes ☐	No ☐
Using Jamboard was fun	Yes ☐	No ☐
Using Pear Deck was fun	Yes ☐	No ☐

14.

I enjoyed using Google Earth	Yes ☐	No ☐
I enjoyed using EdPuzzle	Yes ☐	No ☐
I enjoyed using Jamboard	Yes ☐	No ☐
I enjoyed using Pear Deck	Yes ☐	No ☐

15.

Using Google Earth was easy	Yes ☐	No ☐
Using EdPuzzle was easy	Yes ☐	No ☐
Using Jamboard was easy	Yes ☐	No ☐
Using Pear Deck was easy	Yes ☐	No ☐

16.

I had no problems using Google Earth	Yes ☐	No ☐
I had no problems using EdPuzzle	Yes ☐	No ☐
I had no problems using Jamboard	Yes ☐	No ☐
I had no problems using Pear Deck	Yes ☐	No ☐

17.

It was exciting to answer questions about map skills using Google Earth	Yes ☐	No ☐
It was exciting to answer questions about map skills using EdPuzzle	Yes ☐	No ☐
It was exciting to answer questions about map skills using Jamboard	Yes ☐	No ☐
It was exciting to answer questions about map skills using Pear Deck	Yes ☐	No ☐

18.

Because I used Google Earth, class was interesting	Yes ☐	No ☐
Because I used EdPuzzle, class was interesting	Yes ☐	No ☐
Because I used Jamboard, class was interesting	Yes ☐	No ☐
Because I used Pear Deck, class was interesting	Yes ☐	No ☐

19.

I really like what we did using Google Earth, to learn map skills	Yes ☐	No ☐
I really like what we did using EdPuzzle, to learn map skills	Yes ☐	No ☐
I really like what we did using Jamboard, to learn map skills	Yes ☐	No ☐
I really like what we did using Pear Deck, to learn map skills	Yes ☐	No ☐

20. My favorite technology to use was
    a. Google Earth
    b. EdPuzzle
    c. Jamboard
    d. Pear Deck

APPENDIX E

SEMI-STRUCTURED INTERVIEW QUESTIONS

Hello, and thank you for agreeing to participate in this study. You may choose to stop participating in this study at any time during the interview which should take us about 20 minutes. I want to make you aware that our time together is being recorded so I have a way to recall what was shared and I will also be taking written notes to be as accurate as possible in my data collection. As we go through this interview, I will ask you a series of questions and you will answer each, out loud. Please be honest and clear with each of your answers and you will not hurt my feelings if you have a negative experience or opinion to share. The goal of this discussion is to see what you learned, what you think, and how using EdPuzzle, Jamboard, Google Earth and Pear Deck these past weeks may have impacted your learning.

1. Share with me some examples of when you found using EdPuzzle, Google Earth, Jamboard and Pear Deck during social studies to be enjoyable.
2. When we used EdPuzzle, Google Earth, Jamboard and Pear Deck, which one was your favorite to use? Share with me some examples of what you liked about using _____ and why?
3. When we used EdPuzzle, Google Earth, Jamboard and Pear Deck, which was your least favorite to use? Share with me why you did not like using _____ and why?
4. Tell me a time when you felt like you were putting forth your best effort when you used EdPuzzle, Google Earth, Jamboard or Pear Deck.
5. Did you want to learn when you were using either EdPuzzle, Google Earth, Jamboard and Pear Deck? Tell me why you were motivated to learn more when using _____.
6. When we used EdPuzzle, Google Earth, Jamboard and Pear Deck, did you feel distracted or was it easy to pay attention? Share with me a time when you used _____ and why it helped you pay attention.
7. Of the four technologies we used - EdPuzzle, Google Earth, Jamboard, and Pear Deck - which two did you find the easiest to use? Why?
    a. Share with me examples that made _____ or _____ easy to use?
    b. Share with me examples that made _____ or _____ more difficult to use?
8. In learning about map skills, identify times or /situations where you may have preferred to use a paper assignment instead of EdPuzzle, Google Earth, Jamboard and Pear Deck. Why?

APPENDIX F

UNIVERSITY OF SOUTH CAROLINA IRB APPROVAL LETTER

UNIVERSITY OF
SOUTH CAROLINA

OFFICE OF RESEARCH COMPLIANCE

INSTITUTIONAL REVIEW BOARD FOR HUMAN RESEARCH
APPROVAL LETTER for EXEMPT REVIEW

Ashley Megregian
820 Main Street
Columbia, SC 29208

Re: **Pro00124637**

Dear Ms. Ashley Megregian:

This is to certify that the research study ***The Effects of Technology Integration on Academic Performance and Engagement of Third Grade Social Studies Students: A Mixed Methods Study*** was reviewed in accordance with 45 CFR 46.104(d)(1), the study received an exemption from Human Research Subject Regulations on **10/20/2022**. No further action or Institutional Review Board (IRB) oversight is required, as long as the study remains the same. However, the Principal Investigator must inform the Office of Research Compliance of any changes in procedures involving human subjects. Changes to the current research study could result in a reclassification of the study and further review by the IRB.

Because this study was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

All research related records are to be retained for at least three (3) years after termination of the study.

The Office of Research Compliance is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). If you have questions, contact Lisa Johnson at lisaj@mailbox.sc.edu or (803) 777-6670.

Sincerely,

Lisa M. Johnson
ORC Assistant Director and IRB Manager

APPENDIX G

CONSENT FORM

UNIVERSITY OF SOUTH CAROLINA

CONSENT TO BE A RESEARCH SUBJECT

The Effects of Integrating Google Earth, EdPuzzle, Jamboard, and Pear Deck on Academic Performance and Engagement of Third Grade Social Studies Students

KEY INFORMATION ABOUT THIS RESEARCH STUDY:
You and your child are invited to volunteer for a research study conducted by Ashley Megregian [redacted]. I am a doctoral candidate in the Department of Education, at the University of South Carolina. The University of South Carolina, Department of Education is sponsoring this research study. The purpose of this study is to describe the effects of technology integration on third grade social studies student' academic performance and engagement. You are being asked to participate in this study because heshe is in Miss Megregian's third grade class. This study is being done at [redacted], SC in Miss Megregian's third grade class and will involve approximately 18 volunteers.

The following is a short summary of this study to help you decide whether to be a part of this study. More detailed information is listed later in this form.

This purpose of this study is to understand the impact of technology integration on third grade social studies students' academic performance and engagement with the content at [redacted]Elementary. The expected duration of participation in the study is approximately 5 weeks. The participants will be expected to complete a pre- and post-test to measure their academic performance, semi-structured interviews, surveys on engagement and perceptions on technology integration in the social studies curriculum. Students will already be learning the content as part of the required curriculum that the technology is being integrated into. There are possible benefits to the study such as improved academic performance and/or student engagement.

PROCEDURES:
If you agree to participate in this study, you will do the following:

1. Take the social studies pre-test.
2. The researcher will implement 15-minutes of technology integration activities into the third grade social studies curriculum for 20 academic days. The technology integration lessons will consist of approximately ten-minute mini lessons where instruction will be given followed by you taking notes and completing an activity consistent with the technology integration implementation and concluding with an exit ticket. The notebook will be explained and modeled so that you know how to collect their notes and other information.
3. The teacher will introduce and explain the forms of technology to you (Pear Deck, Jamboard, Ed Puzzle, and Google Earth).
4. Throughout the implementation of technology integration, the researcher will also observe you and your behavioral engagement with the technology integration activities.
5. You will complete the post-assessment at the end of the unit.
6. You will also be given an engagement and perception survey at the end of the 4-week map unit to see your views on the implementation of technology integration activities in social studies.
7. The researcher will also conduct semi-structured interviews with eight of you after the end of the unit.

DURATION:
Participation in the study involves participating in technology integration activities during social studies daily over a 4–5-week period in the Fall of 2022.

RISKS/DISCOMFORTS:
Loss of Confidentiality:
There is the risk of a breach of confidentiality, despite the steps that will be taken to protect your identity. Specific safeguards to protect confidentiality are described in a separate section of this document.

BENEFITS:
Taking part in this study is not likely to benefit you personally. However, this research may help researchers understand the integration of technology into the social studies curriculum.

COSTS:
There will be no costs to you for participating in this study.

PAYMENT TO PARTICIPANTS:
You will not be paid for participating in this study.

CONFIDENTIALITY OF RECORDS:
Information obtained about you during this research may be published, but you will not be identified. Information that is obtained concerning this research that can be identified with you will remain confidential to the extent possible within State and Federal law. The investigators associated with this study, the sponsor, and the Institutional Review Board will have access to identifying information. All records in South Carolina are subject to subpoena by a court of law. Study information will be securely stored in locked files and on password-protected computers.

VOLUNTARY PARTICIPATION:
Participation in this research study is voluntary. You are free not to participate, or to stop participating at any time, for any reason without negative consequences. In the event that you do withdraw from this study, the information you have already provided will be kept in a confidential manner. If you wish to withdraw from the study, please call or email the principal investigator listed on this form.

I have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. If I have any more questions about my participation in this study, or a study related injury, I am to contact Ashley Megregian at [redacted] or email at [redacted]

Concerns about your rights as a research subject are to be directed to, Lisa Johnson, Assistant Director, Office of Research Compliance, University of South Carolina, 1600 Hampton Street, Suite 414D, Columbia, SC 29208, phone: (803) 777-6670 or email: LisaJ@mailbox.sc.edu.

I agree to participate in this study. I have been given a copy of this form for my own records.

If you wish to participate, you should sign below.

Signature of Subject / Participant	Date
Signature of Qualified Person Obtaining Consent	Date

APPENDIX H

ASSENT FORM

UNIVERSITY OF SOUTH CAROLINA

ASSENT TO BE A RESEARCH SUBJECT

The Effects of Integrating Google Earth, EdPuzzle, Jamboard, and Pear Deck on Academic Performance and Engagement of Third Grade Social Studies Students

I am a researcher from the University of South Carolina. I am working on a study about using technology during the social studies lessons and I would like your help. Your parent/guardian has already said it is okay for you to be in the study, but it is up to you if you want to be in the study.

If you want to be in the study, you will be asked to do the following:

- Complete a pre- and post-test.
- Answer some questions through a survey about your views on the integration technology in the social studies unit on maps.
- Meet with me individually and talk about your thoughts and feelings on using technology during social studies. The talk will take about 10-15 minutes and will take place at [redacted] Elementary.

Any information you share with me (or study staff) will be private. No one except me will know what your answers to the questions were. You will also be audio recorded during the interviews. No one except me will hear these tapes.

You do not have to help with this study. Being in the study is not related to your regular class work and will not help or hurt your grades. You can also drop out of the study at any time, for any reason, and you will not be in any trouble, and no one will be mad at you.

Please ask any questions you would like to about the study.

My participation has been explained to me, and all my questions have been answered. I am willing to participate.

_____	_____
Print Name of Minor	Age of Minor
_____	_____
Signature of Minor	Date