7-10-2019

The effects of technology use in a third grade inclusion classroom

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THE EFFECTS OF TECHNOLOGY USE IN A THIRD GRADE INCLUSION CLASSROOM

By

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A Thesis

Submitted to the
Department of Interdisciplinary and Inclusive Education
College of Education
In fulfillment of the requirement
For the degree of
Masters of Arts in Special Education
At
Rowan University
June 30, 2019

Thesis Advisor: Amy Accardo, Ed.D

Dedication

I would like to dedicate this thesis to my mother who served as a Camden City teacher and literacy coach for 38 years of her professional life. She instilled in me a passion for urban education from a young age. I hope to be at least half the educator she was throughout my career. To my family, who made the process of fulfilling my master's degree in education possible: I would not have been able to complete this process without your endless love and support.

Acknowledgement

I would like to acknowledge Dr. Amy Accardo who was consistently patient and supportive throughout the writing and research process of this thesis.

Abstract

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THE EFFECTS OF TECHNOLOGY USE IN A THIRD GRADE INCLUSION CLASSROOM
2018-2019
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Master of Arts in Special Education

The purpose of this single-subject, ABAB research design study was to examine if the integration of Google Classroom and digital texts on Chromebooks promotes student academic performance, specifically their reading level, and active engagement in an inclusive setting. This research was designed to identify the effects that introducing digital texts and comprehension response items in Google Classroom has on student's comprehension and engagement. This study was conducted in an inner-city public k-8 grade school in Philadelphia. The comprehension and engagement scores gathered from students' TDA responses converted into percentages. The data that was collected from students DRA scores in phase A was compared with the DRA data from the final phase B. This data was displayed in line graphs. Students' TDA scores and engagement percentages from phase A were compared with students' percentages from phase B in order to show the changes in performance between phases. It seems that students may be happier using digital texts when reading for pleasure, as opposed to using digital texts for academics. Results suggest Google Classroom tools such as Google Docs and Slides may be useful when conducting research and displaying information rather than when reading for comprehension. Google Slides may be a more productive tool to use if teachers are trying to incorporate technology in their project-based learning classrooms.

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Chapter 1

Introduction

Education, like all other areas of society has adapted alongside the continuous progression of technological advances. The current generation of learners is among the first to enter their schooling with a high level of technological fluency. The Internet is an easily accessible resource for students to find most answers with just the click of a button. Today's educators have the opportunity to become equipped with diverse ways of engaging the minds of young learners in the classroom. The argument over technology's role in educational settings from kindergarten to the graduate level has been evolving since the 1960s (Tamim, Bernard, Borokhovski, Abrami, & Schmid, 2011). Over the decades, technology has become the cornerstone of education's major concentrations – reading, writing, calculating, and thinking (Collins & Halverson, 2018).

The United States Government has devoted billions of dollars towards national initiatives developing the necessary technological infrastructure in schools across the nation, resulting in the ratio of 3 students per one instructional computer. (Liu, Ritzhaupt, Dawson, & Barron, 2017). Districts across the nation should begin to focus on technology in the classroom as a tool to use, early on, in order to promote student's critical thinking skills. Young learners need to be taught how to use their ever-growing knowledge of technology in a positive and effective way across the curriculum. Eventually, the integration of technology in primary classrooms nationwide should lead to more engaged and better performing students in academic areas such as reading, mathematics, writing, and critical thinking.

Students are more easily able to access answers using computers and searching the Internet than ever before. In a speech at an industry conference in 2016, Jonathan Rochelle, the director of Google's educational apps group questioned the idea of teaching today's students the algebraic quadratic equation. He continued to make a bold statement, asking why children can't simply ask Google for the answer to their questions if the answers are undoubtedly there (Singer , 2017).

Statement of the Problem

The shift in education from traditional pedagogy into the era of the Internet brings with it the problem of how to maintain the attention and prepare a generation of students whose future holds jobs that have yet to be produced. Educators can begin to maintain the focus and encourage the creative minds of their students by integrating the use of technology into their daily classroom routine. Educators should ask themselves how they could teach today's students to use their knowledge of technology to benefit society in a long-term way.

Reading Comprehension

On average there are approximately 22 students per teacher in the United States public elementary classroom (US Department of Education, 2017). Students enter the classroom with varying degrees of background knowledge and life experiences. One of the greatest challenges in education is meeting the diverse needs of each student, day to day. Students in the third grade are expected to read and respond to grade-level text in the classroom. According to the Developmental Reading Assessment, third graders should be reading on or above an independent level M through O. Thirty-three percent of my third grade students are currently

reading at or above grade-level, while 75% of my students with disabilities are reading just one level below grade-level. One way to address the complex needs of each learner in the classroom is through differentiating student learning goals, materials, and outcomes.

Differentiation

Differentiation is defined as the process of matching work to students different learning styles and capabilities in order to develop educational opportunities and full access to the curriculum (Platt, 1018). Technology is a way that educators can meet students where they are within their academics. Using educational apps teachers are now able to assign a web-based assessment, which once completed creates a custom digital pathway differentiated to meet individual student's needs. Using technology to differentiate instruction allows for student engagement in various modalities, varying rates of instruction and complexity, and more of an opportunity to engage and challenge students thinking (Stanford, Crowe, Flice, 2010).

Engagement: Chromebooks and Google Classroom

Two common ways to access technology in the primary, student-centered classroom is through the use of one-to-one Chrombooks and the online web tool, Google Classroom. The integration of Chromebooks and Google Classroom promotes quick and efficient access to collaborating and learning in the primary grades. Google Classroom became a new educational app produced by Google for teachers to easily provide students with assignments, interact with the class, provide feedback, and organize student work (Shaharanee, Jamil, & Rodzi, 2016). By 2017,

approximately 30 million students nationwide – more than half of all students between the primary to secondary level – were using Google programs within the classroom in some regard (Singer , 2017).

Chromebooks, which are also Google-powered devices, make up for more than half of the number of electronic devices purchased by schools nationwide (Singer, 2017). Google's affordable devices and academic-friendly programs are leading the educational pathway in the age of technology in the classroom. This study continues to build on the ways that technology integration can affect student's academic progress and engagement across the curriculum.

Significance of the Study

This study aims to examine how the integration of technology will affect the academic progress and engagement of students in an inclusive academic setting. Technology integration will be conducted as a daily routine through utilizing Google Classroom to develop writing and response stamina and digital texts to increase engagement and reading comprehension.

Purpose of the Study

The purpose of this study is to examine if the integration of Google Classroom and digital texts on Chromebooks promotes student academic performance, specifically their reading level, and active engagement in an inclusive setting. This research is designed to identify the effects that introducing digital texts and comprehension response items in Google Classroom has on student's comprehension and engagement.

Research Questions

1. What is the effect of Google Classroom and digital texts on the academic performance of students in an inclusive setting?
2. What is the effect of Google Classroom and digital texts on the active engagement of students in an inclusive setting?
3. Are students satisfied with the use of Google Classroom and digital texts?

Key Terms

Differentiation - For purposes of the present study differentiated instruction is defined as the process of matching work to students' different learning styles and capabilities in order to develop educational opportunities and full access to the curriculum (Platt, 1018)

Google Classroom - For purposes of the present study Google Classroom is defined as platforms that give students the accountability needed to create, explore, and control their instruction in a student-centered classroom where they have the opportunity to take ownership over their work spaces (Johns et al. 2017).

SLD – Specific Learning Disability - For purposes of the present study SLD is defined in Sec 300.8 (c) (10) as "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations" (IDEA, 2004).

Chapter 2

Review of Literature

This literature review is aimed at analyzing and interpreting data collected through published literature directly related to student engagement and technology use in the classroom. To begin this review, the acronym SLD and the phrase inclusive classroom setting were used as search terms. This chapter focuses on technology-based instruction and tools that allow for differentiation for students with SLD.

Students with SLD in the Inclusive Setting

As stated in the Individuals with Disabilities Education Act, SLD is defined in IDEA Sec 300.8 (c) (10) as, "a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations" (IDEA, 2004). According to the Council for Exceptional Children, an inclusive classroom is one in which a child is being educated to the maximum extent appropriate in the setting that he or she would otherwise be attending if an exceptionality did not exist (2007).

Educating more students with learning disabilities within the general education classroom, as opposed to in self-contained and pullout resource rooms, has been seen as essential over the past two decades in education reform (Sailor, 1991). Brownell et al. (2006) reported that general education teachers feel under-prepared to meet the needs of students with disabilities in inclusive classroom settings.

All students are required, under the No Child Left Behind Act, to participate and perform on statewide high stakes testing in order for schools to meet annual yearly progress (2001). General education teachers must differentiate their instruction in order to meet the needs of diverse learners in the inclusive classroom. General education teachers might differentiate content in the classroom by using various leveled texts through multiple means such as listening to texts and by using the internet (Algozzine & Anderson, 2007).

Moving forward, differentiating instruction for students with exceptionalities should be easier by use of technology. Differentiating instruction with technology allows for teachers to meet the needs of learners by using various modalities. Technology in the classroom also provides teachers with the unique opportunity to engage, motivate, and challenge students by varying the rate of instruction and altering complexity levels (Stanford, Crowe, Flice, 2010).

Differentiation by the Use of Technology Integration

Technology in the classroom can be used as a tool to assist in closing achievement gaps in student learning that currently exist due to differences in a student's culture, life experiences, and socio-economic status. Students therefore enter the classroom with varying degrees of background knowledge. "Attending to student readiness by using technology for differentiating instruction allows for academic growth, enlists student motivation, and enables teachers to attend to the student learning profiles in various ways so that students acquire knowledge in a variety of mediums… it often decreases the amount of time required by teachers to create differentiated content. In addition, the use of technology can create an

environment in which active engagement leads to on-task students. On-task and engaged students can be expected to learn more" (Stanford et al. 2010 p. 4).

Carney (2015) used Chromebooks and Google applications as instructional tools in order to differentiate instruction for 41 mixed-ability sixth graders and found that students received higher grades when their assignments were differentiated by both interest and ability level. The Google applications that were used throughout the study were Google Documents, Google Presentations, Google Slides, Google Forms, Google Draw, and Doctopus. The students at the Northwestern Ohio intermediate school were assigned two projects, a self-evaluation form, and a quiz using Google applications.

The first assignment was an invertebrate project, that students used Google Presentations in order to report their research findings on invertebrate groups. Students who participated in this study were given a choice on which invertebrate organisms they were interested in researching and presenting. Carney was able to provide instant feedback while students worked by using the comment tool on Google Presentations. Students then used Google Documents to complete a self-evaluation that required students to reflect on their projects and think of ways that using instant feedback through Google comments helped to improve the quality of their work. The next assignment was an inquiry-based project, which required students to calculate shopping totals using Google Spreadsheets. The final assignment was a math quiz, which was modified for three different ability levels. The participants of the study then completed a math quiz at their independent ability level using Google Forms.

Based on student progress, the goal of differentiating student work was successfully met while using technology to improve student engagement, collaboration, and creativity throughout assignments (Carney, 2015). Moreover, differentiating student work while requiring the use of similar technological programs such as Microsoft Word, Excel, and PowerPoint fosters higher levels of motivation and independence while building upon real-world skills that students will need in the future (Stanford et al. 2010).

Google Products and Their Appeal Within Education

In May of 2011 Google announced its first ever Chromebook, a low-powered laptop that comes equipped with Google education applications (Singer, 2017). In a New York Times article, Singer identifies 30 million students, about half of today's primary and secondary students, as the targeted customers who are utilizing Google education applications in classrooms throughout American schools. One tool that can be accessed through the Google Chromebook is the G suite, which hosts Google apps such as Google Classroom, providing students with apps including a word processor and presentation generator (Johns, Troncale, Trucks, Calhoun, Alvridez, 2017). G suite and Google Classroom are platforms that give students the accountability needed to create, explore, and control their instruction in a student-centered classroom where they have the opportunity to take ownership over their work spaces (Johns et al. 2017).

Ventayen, Estira, Guzman, Cabaluna, and Espinosa conducted a study that evaluated Google Classroom in hopes of identifying the usability of its functionalities, features, and students' satisfaction levels. Just fewer than 60

participants made up this study, which included collegiate level faculty and students working towards earning either their Bachelors of Science or Bachelors of Art. Students and staff were presented with the G suite tool for education and asked to rate the tool in the areas of understandability, learnability, operability, and attractiveness (Ventayan et al. 2017). With the overall rating being that Google Classroom is very effective, the participants of this study rated their ability to understand G suite's tool at 56%, learnability at 50%, ease of operating at 62% and attractiveness at 51%.

The limitation that exists within this study is the small sample size and the level at which the study was conducted. Although the participants in this study rated Google Classroom as highly effective, it is difficult to generalize these findings to students working at various primary and secondary levels. A similar study must be conducted in order to determine how younger students would rate their ability to understand, learn, and operate the application.

In a single-subject design study conducted by DiCicco (2016), six middle school students with LD used Google Classroom to learn social studies content and vocabulary. In this study, the teacher utilized the Google Classroom platform in order to supply students with questions, links, PowerPoints, videos, documents, games, study guides, and tests over the course of nine weeks (Dicicco, 2016). Dicicco used unit tests, vocabulary quizzes, and a survey as ways to measure student outcomes.

Similar to the findings of Ventayan et al., the participants gave Google Classroom an overall positive response rating conveyed through a survey conducted

by both the teachers and students involved. Google Classroom was evaluated by rating it's likability, ease of using the program, conducting online research, and finding usable links, student preference, and an overall increase in student writing, vocabulary practice, and interactions (Dicicco, 2016).

Despite the positive rating for the G suite Google application itself, the small sample size is a limitation, along with various levels of student background knowledge, and a limited timeframe for conducting research (Dicicco, 2016).

Technology Integration on Student Engagement

In a study that focused on student engagement while using technology in a second grade classroom, Hamilton-Hankins (2017) found that using technology gave teachers the opportunity to provide students with engaging learning activities that invited students to become active members in their learning experience. Ten second grade students were the participants in a study that focused on observational field notes, student questionnaires, and engagement checklists as its main source of data collection. Hamilton-Hankins used student's behaviors as one form of data collections in order to measure student engagement. The behaviors that were measured throughout this study included time on task, levels of participation, level of work completion, students' perceptions of relevancy of task, and the degree at which students and teacher were satisfied with engagement (Hamilton-Hankins, 2017).

Within this action research, Hamilton-Hankins integrated technology into the normal English Language Arts block of instruction. Students utilized websites to conduct research, electronic graphic organizers, Google Draw, Google Presentation,

online assessments, and collaborated with the teacher, peers, and parents using Google Classroom's comment and "live feed" tool (Hamilton-Hankins 2017).

There were four themes that emerged as a result of this action research study. The themes that could be seen after data analysis were: technology integration made student learning more interesting, students were more engaged in the lesson when immediate feedback was provided, student's assignment completion rate was heightened while using technology when completing ELA assignments, and technology integration into normal classroom instruction contributed to higher levels of affective and behavioral student engagement (Hamilton-Hankins, 2017).

Summary

The use of lectures, visual aides, presentations, and whiteboards in the teacher-centered, traditional method of teaching, does not allow for learning experiences that can take place while using technology in the classroom. Educators can provide students with the opportunity to exercise, experience, demonstrate, and investigate through use of technology integration in the classroom (Shaharanee et al., 2016). Technology is not only useful in making differentiating student work easy to manage, but daily integration also provides students with real-world experiences that will be beneficial for students' learning later in life. Meeting students at their independent level of readiness allows for academic and motivational growth, and aides in supporting teachers in differentiating instruction by providing students with various forms of instructional mediums (Sanford et al., 2010). Various

instructional mediums include Google applications via the use of Google-powered Chromebooks and leveled digital texts.

Chapter 3

Methodology

Setting

School. This study was conducted in an inner-city public k-8 grade school in Philadelphia, Pennsylvania. There are approximately 400 students who attend the school. The demographics that make up the school are 72% African American, 21% Latino, 2% Asian, 1% Caucasian, and 4% multicultural. Twenty-seven percent of students who attend the school receive special education services. The school has three autistic support classrooms, two emotional support classrooms, and uses the mainstreaming model of special education for students with IEPs in the regular education classroom.

The school day begins at 8:30, and every student is given the opportunity to enter the building at 8:15 to obtain a free breakfast prior to the first bell. All students receive free lunch. As a requirement per the school district, 135 minutes are allotted for ELA instruction each day. The components of the ELA block include read aloud, shared reading, independent reading, guided reading, center time (individualized instruction), and grammar/writing.

Classroom. The classroom where the study took place is a regular education third grade classroom comprised of 15 students. There is one teacher in the classroom with an instructional aide for half of the day, each day of the week. Students with IEP goals leave for two 45-minute periods throughout the day in order to receive instructional interventions to meet their IEP goals.

Most of the instruction takes place in small group/blended learning settings in the classroom. There is one laptop, which belongs to the teacher that is connected to a Smartboard at the front of the room. Students primarily sit on the rug, or in flexible seating arrangements around the rug while instruction takes place. There is one Chromebook cart in the classroom that holds 25 Google Chromebooks. Each student has access to their individual Google Chromebook, which they maintain at their desk throughout the day.

Participants

This study included four third grade students, three males and one female. One of the students was classified with a SLD, while the other three were classified with a speech and language impairment. One student was waiting for an official evaluation by the school psychologist with a permission to evaluate signed prior to the start of this study.

Table 1

General Information of Participants

Student	Age (years)	Grade	Classification
A	8	3	SLD
B	8	3	SLI
C	9	3	SLI
D	8	3	Awaiting Classification

Participant 1

Student A is an 8-year-old African American male student. He is eligible for special education services under the classification SLD. This student has a twin brother who is classified on the Autism Spectrum (AS) and is in the 3-5 AS classroom placement. Student A has IEP goals that reflect specific behaviors, such as participating, volunteering, and working with peers. He is one level below grade-level but enjoys reading. He is a more active learning during the math block opposed to the ELA block.

Participant 2

Student B is an 8-year-old African American female student. She is eligible for special education services under the classification SLI. Student B reads one level below grade-level and has need in the area of oral reading fluency due to a speech impairment.

Participant 3

Student C is a 9-year-old African American male student. He is eligible for special education services under the classification SLI. Student C was retained in the second grade. He has made enough progress to maintain a reading level just below grade-level. His main reading challenge is his oral reading fluency.

Participant 4

Student D is an 8-year-old African American male student. He was awaiting a formal evaluation with a permission to evaluate signed prior to the start of this study. Student D displays severe behaviors, such as eloping from his seat, refusing to do classwork, and arguing with his peers. He reads independently on the first grade level, according to his DRA scores. Student D also has a speech impairment. He stutters when he shares with the class, is excited or escalated, or during normal conversation. Student D has need in the area of developing and maintaining relationships with his peers.

Materials

A single subject research design with multiple baselines was used throughout the course of this study. The independent variable being evaluated in this study was the use of digital texts and online assignments in Google Classroom. The dependent variables assessed were reading comprehension and engagement of third graders. Developmental Reading Assessment scores (comprehension and oral reading fluency) were collected prior to the initial baseline phase of this study. In the initial baseline phase, students used Google Chomebooks to access online reading materials as digital texts. Student responded to text dependent analysis

(TDA) response items using pencil and paper. During the second phase of the study students used both digital texts on Google Chromebooks and Google apps, including Google Classroom, Google Docs, and Google Slides.

Research Design

This study used a single-subject, ABAB research design. During phase A students used their Chromebooks to read digital texts from the general education curriculum. Students responded to TDA items using the traditional method of pencil and paper throughout phase A. In phase B, students were taught to access TDA prompts using Google Classroom. Students were able to use Google Classroom to create Google Docs and Google Slides in order to respond to TDA prompts. Student's reading comprehension was re-assessed throughout phase B, where students responded to TDA prompts using the traditional pencil and paper method of response. The Google Classroom intervention was reintroduced in the final phase B of the research design.

Procedures

This study took place over eight weeks. Prior to the study, students completed a Developmental Reading Assessment (DRA), which tests students' reading comprehension and oral reading fluency. The pre-assessment was done in order to obtain students' current instructional and independent reading levels.

Following the initial assessment, students read assigned passages two times a week using online-digital texts on Google Chromebooks. After reading, students responded to TDA response items. Students returned to the traditional method of reading from the text and submitted pencil-paper responses after three weeks of

observations. After the second base line was collected, students continued to read online texts from their Google Chromebooks. During the second phase of the intervention students started using Google Classroom in order to respond to TDA questions in the form of Google Forms, Google Documents, and Google Slides. The intervention continued for an additional three weeks until the third and final baseline was collected, which included a final DRA assessment.

Measurement Procedures

DRA scores. Following the study, students were re-assessed using the DRA.

TDA scores. Student's TDA scores were assessed throughout the study using a 4 point TDA rubric.

Student participation. Student participation was measured throughout the study using a teacher observation sheet.

Data Analysis

The scores gathered from students' TDA responses and engagement were converted into percentages and put into tables. The data from these two variables were displayed in line graphs. The data that was collected from students DRA scores in phase A was compared with the DRA data from the final phase B. This data was displayed in line graphs. Students' TDA scores and engagement percentages from phase A were compared with students' percentages from phase B in order to show the changes in performance between phases.

Chapter 4

Results

Summary

In this single subject design study, the effects of technology use on the reading engagement and comprehension of four special needs students in a third grade inclusion setting classroom were examined. The research questions to be answered were:

1. What is the effect of Google Classroom and digital texts on the academic performance of students in an inclusive setting?
2. What is the effect of Google Classroom and digital texts on the active engagement of students in an inclusive setting?
3. Are students satisfied with the use of Google Classroom and digital texts?

The students

The students were assessed in the beginning of the year, and then again at the close of each marking period using Pearson's Developmental Reading Assessment 2nd Edition (DRA2) to obtain their current reading levels. This assessment measures student's reading accuracy, comprehension and fluency with leveled texts. The levels obtained from students most recent DRA measure was used to assign leveled texts through Get Epic for baseline, intervention, and final phases of this study.

Group Results

Table 1 shows the minutes spent on task and comprehension results for each of the four participants. The table shows the average number of minutes spent

engaged on the reading task throughout the baseline phase, intervention phases, and post intervention phase. The average DRA comprehension score and TDA score from each phase is displayed as percentages in the table. The DRA assessment has a total possible score of 28. The TDA response items were scored based on a four-point rubric.

In addition, Table 1 displays the individual and group comprehension and engagement scores across all sections, as well as the group comprehension and engagement overall means. In the area of comprehension, the overall group mean throughout baseline 1 was 66%. The overall group mean at intervention 1 was 29.1%. The overall group mean at baseline 2 was 55.5%, and the overall group mean at intervention 2 was 41.6%. Each student scored better in the post-intervention assessment with a group overall mean of 71.5%. In general, students received better scores while using pencil paper assessments opposed to the overall mean scores in the intervention phases, using computer-based texts and response items.

The overall mean score for minutes spent engaged on a task in the baseline phase was 7 total minutes. Students spent a mean score of 7.2 minutes engaged throughout intervention phase 1, and the same mean of 7.2 minutes spent engaged on their task during baseline phase 2. An over mean score of 7.4 minutes was spent engaged on task during intervention phase 2, and an increased mean of 7.5 total minutes on task throughout the post-intervention phase.

Table 2

Comprehension and Engagement Results

	COMPREHENSION (percentage)					ENGAGEMENT (average minutes spent on task)					Difference Between Baseline and Post Interven-tion	
Participants	*Baseline*	*Intervention Phase*			*Post Intervention*	*Baseline*	*Intervention Phase*			*Post Intervention*	*Comprehension (Percentage)*	*Engagement (Average)*
		A	*B*	*A*			*A*	*B*	*A*			
1	64	16.6	33.3	41.6	68	13	12.3	13.3	12.6	13	4	0
2	68	33.3	50	41.6	75	7	5.6	5	6.3	6	7	-1
3	71	58.3	66.6	66.6	75	6	7.6	7.3	7.3	7	4	1
4	61	8.3	16.6	16.6	68	2	3.3	3.3	3.6	4	7	2
MEAN	66	29.1	55.5	41.6	71.5	7	7.2	7.2	7.4	7.5	5.5	.5

Individual Results

Figure 1 displays the comprehension scores obtained from DRA results and TDA responses for Student A throughout the ABAB phases. Student A's initial comprehension baseline mean score was 64%. During the first intervention phase, the score decreased to 16.6%. The mean score obtained at the close of the second baseline phase was 33.3%. His mean score throughout the second intervention phase increased to 41.6%. The mean comprehension score for Student A at the close of the study increased to 68%.

Figure 2 displays the comprehension scores obtained from DRA results and TDA responses for Student B throughout the ABAB phases. Student B's initial comprehension baseline mean score was 68%. During the first intervention phase, the score decreased to 33.3%. The mean score obtained at the close of the second baseline phase was 50%. His mean score throughout the second intervention phase decreased again to 41.6%. The mean comprehension score for Student B at the close of the study increased to 75%.

Figure 3 displays the comprehension scores obtained from DRA results and TDA responses for Student C throughout the ABAB phases. Student C's initial comprehension baseline mean score was 71%. During the first intervention phase, the score decreased to 58.3%. The mean score obtained at the close of the second baseline phase increased to 66.6%. Her mean score throughout the second intervention phase remained the same at 66.6%. The mean comprehension score for Student C at the close of the study increased to 75%.

Figure 4 displays the comprehension scores obtained from DRA results and TDA responses for Student D throughout the ABAB phases. Student D's initial comprehension baseline mean score was 61%. During the first intervention phase, his mean score was 8.3%. The mean score obtained at the close of the second baseline phase 16.6%. His mean score throughout the second intervention phase remained the same at 16.6%. The mean comprehension score for Student D at the close of the study increased to 68%.

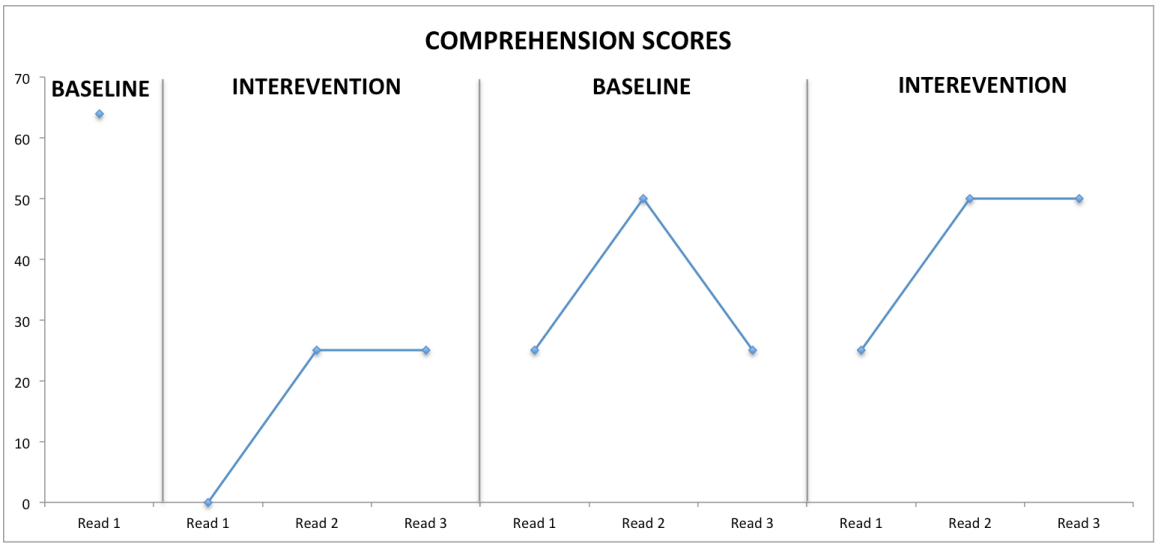

Figure 1. Participant 1 Comprehension Results

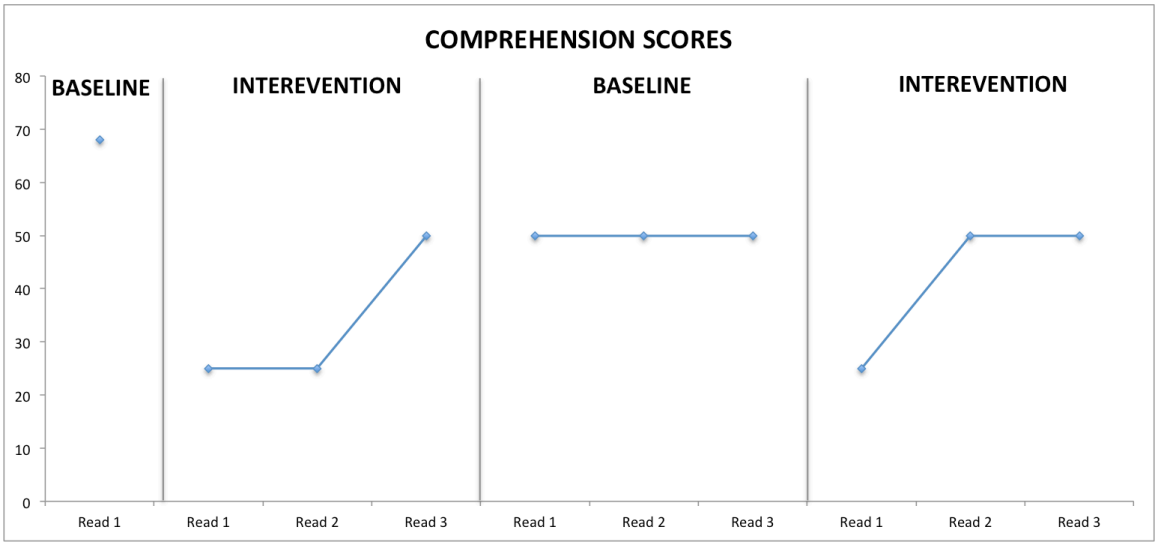

Figure 2. Participant 2 Comprehension Results

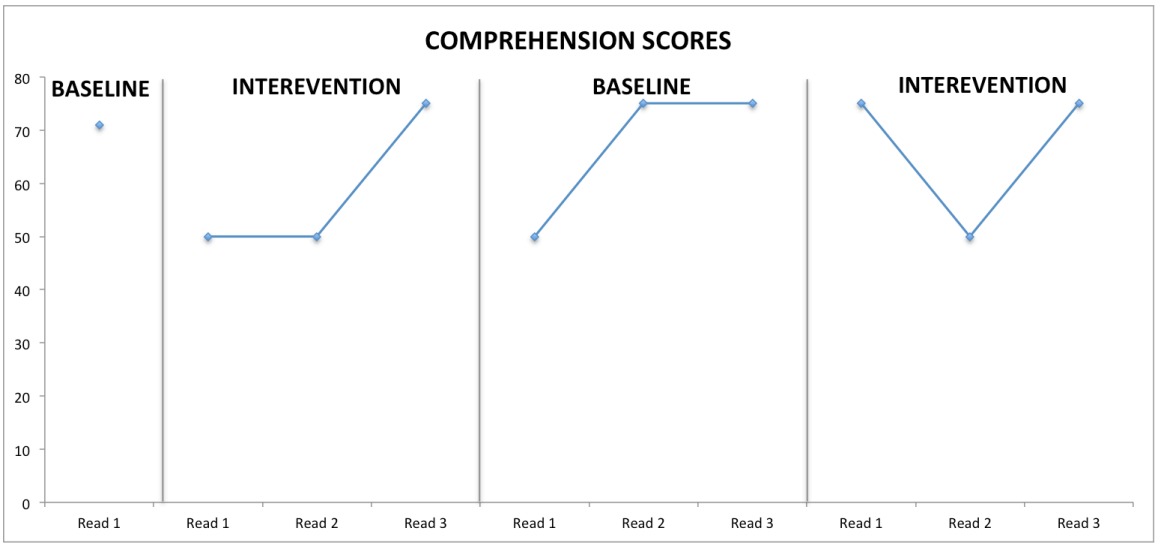

Figure 3. Participant 3 Comprehension Results

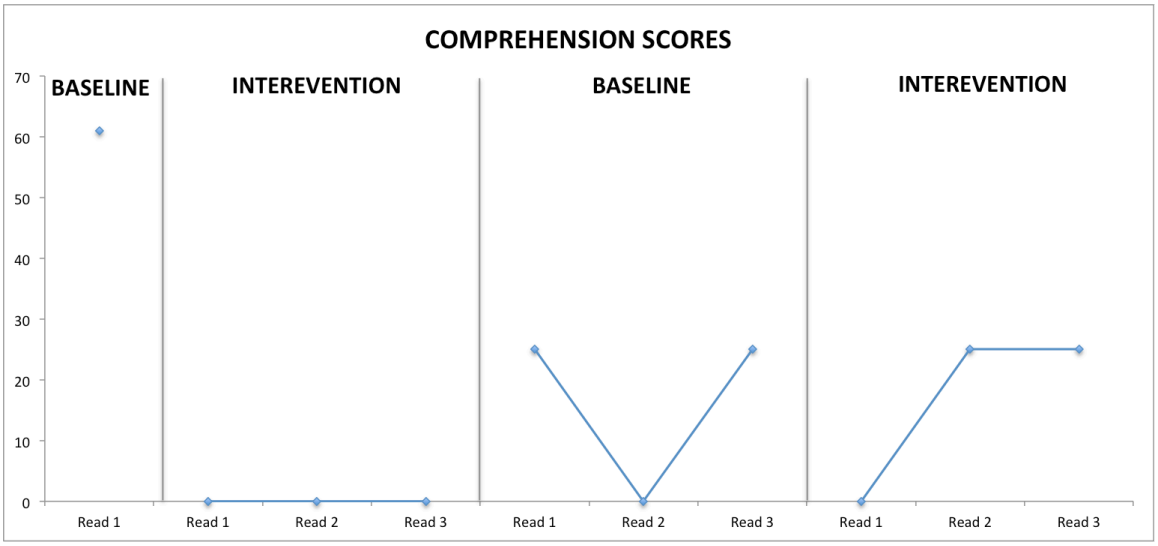

Figure 4. Participant 4 Comprehension Results

Engagement Measures

Engagement scores were measured using a time on-task behavior checklist. Student's behaviors were monitored while working independently on tasks throughout the baseline and intervention phases of this study. The time spent independently on a task was observed from the time students started work on their assignment until their first instance of off task behaviors. Off task behaviors were classified as non-disruptive behaviors (i.e. raising a hand for further direction), disruptive-to-self behaviors (i.e. getting off of assigned website), and disruptive-toward-others behaviors (i.e. talking to a peer/calling out).

Figure 5 depicts the academic engagement scores for Student A throughout all phases of data collection. Student A displayed a mean of 13 minutes of on-task behavior during the initial baseline phase. The academic engagement of Student A decreased to a mean of 12.3 total minutes on task during the first intervention phase. During the second baseline data collection, Student A increased on-task behaviors to a mean of 13.3 minutes on task. In the final intervention phase, Student A displayed a mean resulting in 12.6 minutes of on-task behaviors.

Student B's academic on-task behaviors throughout all phrases of data collection are displayed in figure 6. Student B displayed a mean of 7 minutes of on-task behavior during the initial baseline phase. The academic engagement of Student B decreased to a mean of 5.6 total minutes on task during the first intervention phase. During the second baseline data collection, Student B decreased on-task behaviors to a mean of 5 minutes on task. In the final intervention phase, Student B displayed a mean resulting in 6.3 minutes of on-task behaviors.

Figure 7 depicts the academic engagement scores for Student C throughout all phases of data collection. Student C displayed a mean of 6 minutes of on-task behavior during the initial baseline phase. The academic engagement of Student C decreased to a mean of 7.6 total minutes on task during the first intervention phase. Her on-task engagement mean score decreased to 7.3 minutes throughout both the second baseline phase and the second intervention phase.

Figure 8 shows the academic engagement scores for Student D throughout all phases of data collection. Student D's engagement throughout the baseline phase totaled a mean of 2 minutes of on task behavior. He increased the total minutes of on task behavior to a mean score of 3.3 minutes throughout the initial intervention phase. He continued to display a mean of 3.3 total minutes of on task behavior throughout the second baseline phase. In the final intervention phase, Student D displayed a mean resulting in 3.6 minutes of on-task behaviors.

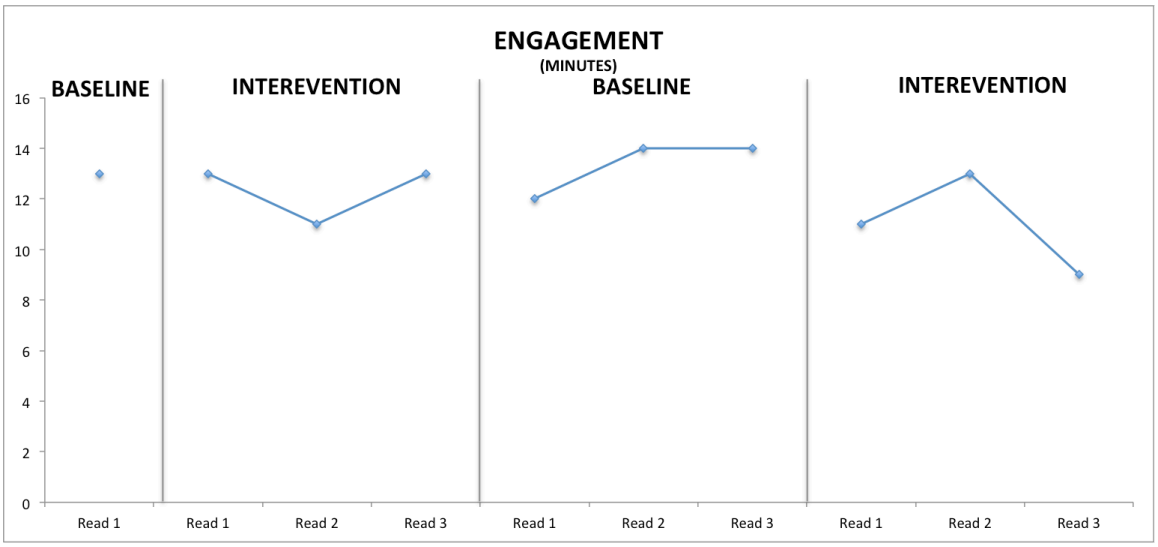

Figure 5. Participant 1 Reading Engagement Results

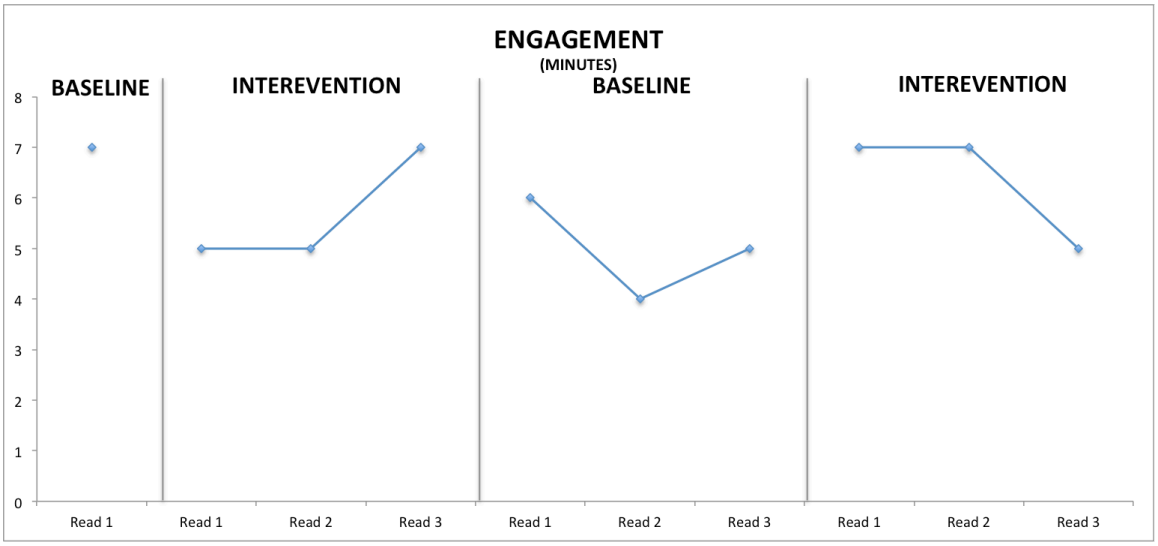

Figure 6. Participant 2 Reading Engagement Results

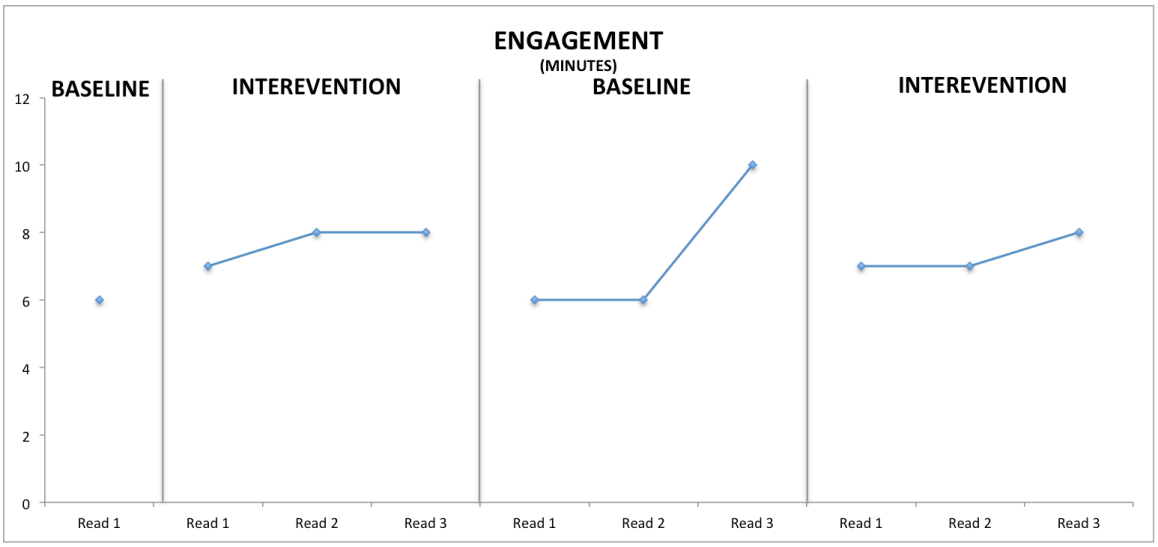

Figure 7. Participant 3 Reading Engagement Results

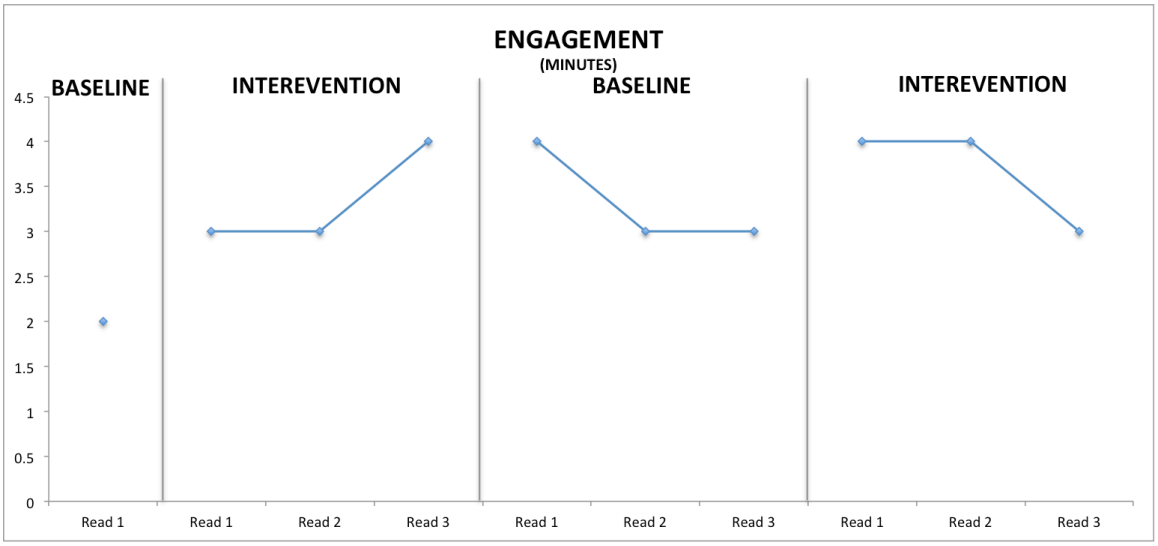

Figure 8. Participant 4 Reading Engagement Results

Survey Results

A student satisfaction survey was conducted at the close of the study. Students participated in the survey by using a student-friendly Likert Scale with pictures. Students rated their experience with using digital texts and Google Classroom by selecting from among five choices labeled very satisfied, satisfied, neutral, unsatisfied, or very unsatisfied.

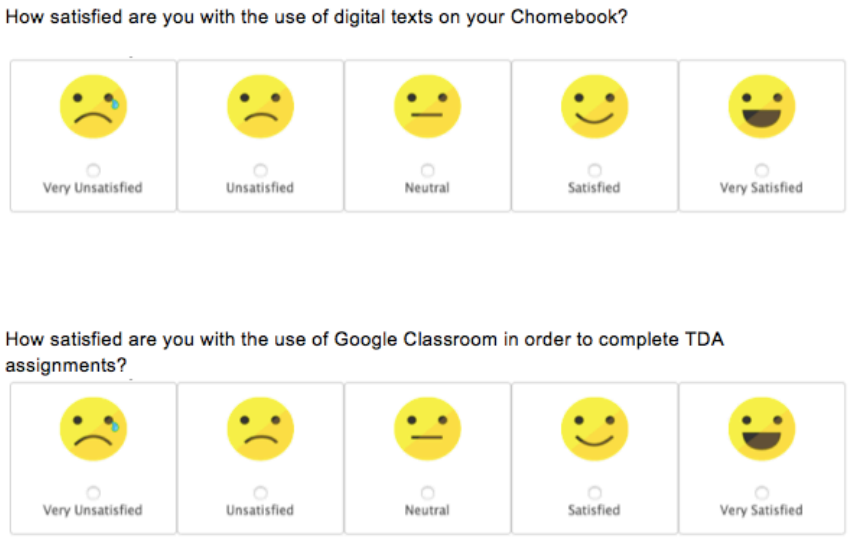

Figure 9. Student Survey

The four students whose comprehension and engagement scores were documented throughout this study also took part in a student satisfaction survey that reviewed the use of digital texts and Google Classroom. Two out of four students indicated that they were very satisfied with accessing digital texts using their Chromebooks. One student felt neutral about the use of digital texts using his Chromebook, and the fourth student indicated that he was very unsatisfied using his

Chomebook to access digital texts online. Three out of four students indicated they were very unsatisfied with using Google Classroom in order to respond to TDA prompts, while one student indicated that she was satisfied using Google Classroom to respond to TDA prompts.

Chapter 5

Discussion

The purpose of this study was to determine the effects that using digital texts and Google Classroom has on the comprehension and engagement of third graders in an inclusive classroom. At the close of the study, the participants were asked to take part in a survey that examined their feelings towards using digital texts and Google tools.

Findings

The results of this study did not effectively conclude that the incorporation of digital texts and Google tools helps to promote engagement in third grade students' time on task. All four students' DRA reading comprehension scores did improve after the digital texts and Google tools were used throughout the intervention phases. The DRA was given in a traditional style, which requires students to read a hardcopy text, and respond to comprehension questions using pencil and paper. Seventy-five percent of the students in this study scored either lower or the same on comprehension questions when they were using digital texts and Google tools compared to the traditional style of reading and responding with pencil and paper.

All of the students showed an increase in reading comprehension scores when they transitioned back to using a hardcopy text along with pencil and paper in phase B of the study. Only one student's comprehension score increased in the last intervention phase, when he used digital texts and Google Classroom to respond to TDA comprehension questions. Two other students had scores that remained the same, and one student's comprehension score dropped when he was required to use

digital texts and Google Classroom to respond to TDA comprehension questions. All four students showed an increase in their reading comprehension scores when they completed their DRA, using a hardcopy text along with pencil and paper to record their comprehension responses.

There were similar findings in studies that incorporated Google tools into education conducted by Ventayan et al (2017) and DiCicco (2016). In both studies, the researchers presented students with Google tools for education and then conducted a survey to see how students would rate the tools. In both cases, students gave the Google tools an overall positive rating. This is not similar with the results of student surveys in the present study. Three out of four students said they were very unsatisfied with the use of Google tools to respond to TDA prompts throughout the study.

Hamilton-Hankins (2017) determined four themes after conducting research that examined students' engagement rates while using technology in the classroom. The four observations made were lessons were more interesting using technology, students were more engaged, there was an increased rate of work completion, and disruptive behaviors decreased. These results are similar to the findings in this study in two out of the four cases. Two students showed increased engagement scores throughout the study when technology was involved. The other two students had decreased engagement scores due to challenges with technology and became off-task.

Limitations

The present study has several limitations. The primary limitation is the small group size that the study was conducted with. An additional limitation is the setting in which the study was conducted. This study was conducted with a class size of 15 students, and 4 student's results were analyzed throughout the course of the study. The student's whose reading and engagement behaviors were analyzed are four students from a low socioeconomic area in an inner-city school. The students live in low-income housing, and their families do not have the means to provide them with technology such as tablets, computers, and cell phones at home. This results in students having less experience with technology prior to using Chromebooks in the classroom.

The results of this study may vary depending upon student's previously established technology use and skills. The results may also vary based on student's reading level and technology preferences. Students who have had more exposure to technology use in the home may have better results than students who have little experience with using technology. Throughout this study students had varying degrees of reading levels and preference for reading as well as technology. Students who are closer to reading level may show better results while incorporating technology into the reading curriculum. Students who enjoy using technology may show better results as well.

Implications and Recommendations

Due to an increase in technology use at my school this study was conducted to examine how using Chomebooks in daily instruction could affect student's

engagement and comprehension. Implementing Chromebook use to read digital texts such as online books and articles found on Google may be an effective way to help students actively read and understand information if it is done in project-based way.

Implications for Research

Further studies should be conducted in this area of research. Future studies may focus on students' engagement and comprehension outside of reading digital texts. Students should be given the opportunity to use the Google search feature to learn about topics and display information in a project-based format. Google Slides is a great way to gather and display information in a creative way. Results of future studies may vary based on the type of work students are asked to complete and the level of interest students have pertaining to the research topic.

Conclusions

Overall, it seems that students may be happier using digital texts when reading for pleasure, as opposed to using digital texts for academics. Results suggest Google Classroom tools such as Google Docs and Slides may be useful when conducting research and displaying information rather than when reading for comprehension. Google Slides may be a more productive tool to use if teachers are trying to incorporate technology in their project-based learning classrooms. This research should be conducted on a larger scale, using digital texts and Google Classroom tools to display information gained through research on one topic.

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