Summer 2017

Literary Devices: Effects of Classroom Management on Student Engagement with 1:1 Devices

Elizabeth Parker
Central Washington University, parkerbet@cwu.edu

LITERARY DEVICES: EFFECTS OF CLASSROOM MANAGEMENT ON STUDENT ENGAGEMENT WITH 1:1 DEVICES

A Thesis

Presented to

The Graduate Faculty

Central Washington University

In Partial Fulfillment

of the Requirements for the Degree

Master of Education

Special Education

---

by

Elizabeth Kay Parker

July 2017

CENTRAL WASHINGTON UNIVERSITY

Graduate Studies

We hereby approve the thesis of

Elizabeth Kay Parker

Candidate for the degree of Master of Education

APPROVED FOR THE GRADUATE FACULTY

_____ _____
Dr. Janet Spybrook, Committee Chair

_____ _____
Dr. Sharryn Walker

_____ _____
Dr. Wendie Castillo

_____ _____
Dean of Graduate Studies

ACKNOWLEDGEMENTS

I have been deeply fortunate in the amount of love and support I have received throughout this project. A heartfelt thank you to the Easton School District and the GEARUP program who provided the opportunity to pursue this Master's program. More gratitude for Dr. Spybrook and her patient guidance along the way. Thank you to Drs. Castillo and Walker for agreeing to be my committee.

My sixth grade students were willing and eager to participate in this study. They were enthusiastic and patient with me. I could not have asked for better or more delightful helpers. They upheld their end of the bargain, so I upheld mine.

The biggest thank you goes to my loving and infinitely patient husband, Andrew. He was more than willing to pick up my slack and pour me another glass of wine while I disappeared into this work. Not once did he complain about the incredible number of episodes of Texas Flip N' Move that I watched while typing the original draft. His unfailing love and support has been instrumental.

The acknowledgements would not be complete without mentioning Nimbus and Waffle, who snuggled and purred throughout this whole process. When it was time to take a break, one of them could usually be counted on to park themselves on my keyboard and force me to stop working.

ABSTRACT

The study compares two different classroom management strategies in a 5th and 6th grade classroom using an iPad based intervention. The students participated in 10 sessions of a language and grammar intervention on the *Moby Max* program. During five of the sessions, the teacher actively monitored the classroom, walking around the room, and redirecting students as necessary. For the other five sessions, the teacher used data from the intervention and monitored and redirected students from her computer screen.

The data collected included the number of corrections given to each student by the teacher, the number of minutes the program considered each student active, and the percentage of time during the session the student was engaged with their work. The average of each of these measurements over the five sessions for each student was compared across the two classroom management styles. A statistical t-test was calculated to ascertain if there was a meaningful difference between the two variations.

Of the three measurements taken, the percentage of focus time and the number of corrections were not found to have a statistical difference. The number of minutes of logged, however, was higher during the sessions when the teacher was actively monitoring.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

Table Page

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Many teachers, principals, and parents understand the importance of engagement for positive student outcomes throughout a student's academic career. Engaged students show "sustained behavioral involvement in learning activities accompanied by a positive emotional tone" (Skinner & Belmont, 1993, p. 572). These students are more likely to achieve in school compared to their more disaffected peers (Skinner & Belmont, 1993). Engaging students is a paramount concern for schools (Grey & DiLoreto, 2016).

Utilizing technology in classrooms is one solution to engaging reluctant learners (Aubusson, Burke, Chuck, Kennedy & Frischknecht, 2014). Turning content into digital games, engrossing video presentations, and access to near-infinite information is tantalizing. As the 21st century progresses technology, including 1:1 devices such as tablets, laptops, and mobile phones, are becoming increasingly ubiquitous in classrooms (Selwyn & Facer, 2014). Lessons presented in the digital format provide new opportunities and challenges for teachers (Aubusson et al, 2014). While access to all the information available on the World Wide Web is powerful, it can make classroom management difficult. Ensuring that students are synthesizing appropriate content has become part of the modern teacher's job.

As is the case with teaching any subject and age group, with any tool, there are a variety of management techniques available (Falloon, 2015). Some classroom management strategies made available by 1:1 devices and digital curriculum are effective, but perhaps less so than other strategies. While teachers may be tempted to use techniques that rely most heavily on their students' devices, these may not be the best choice for maintaining and harnessing student engagement (Aubusson et al, 2014).

Statement of the Problem

Technology such as teacher computers, digital grade books, student devices, SmartBoards and so much more have become nearly indispensable to the daily business of teaching and learning. Despite how accustomed K-12 education has become to its technology, iPads and other 1:1 devices are still newcomers to the academic stage (Falloon, 2015). There is still much to learn about the most effective methods for managing technology in the classroom. The body of research has not yet fully caught up to the ubiquity of the devices themselves (Falloon, 2015).

The possibilities of iPads in the classroom are nearly endless. Hundreds of school districts across the country have implemented 1:1 device models in their school buildings (Falloon, 2015). Classroom teachers, regardless of their technological skill, are learning how to utilize these tools, hopefully for the ultimate benefit of their students (Falloon, 2015). While data is encouraging regarding the use of technology to increase student engagement, many teachers may be teaching with devices without a full understanding of how they are best implemented. Within this complicated issue lie the intertwined topics of classroom management, teachers' relationships with their students, the students' engagement in and with their learning, and the effects on engagement on academic achievement.

Technology and Student Engagement

Technology within the classroom has great potential to increase student engagement (Smith, 2014). Decades of research have found that situational learning is a factor in motivating students. Making learning more relevant to the students' lives consistently increases students' engagement in their learning. Smith (2014) asserts the potential of digital curriculum to create more situational learning. Gamification, using video and interactive game style programs to

teach content, is an example of situational learning. However, many teachers and administrators are unfamiliar with the far-reaching benefits (Smith, 2014).

Teachers' and parents' perceptions of technology have a major impact on their students' relationships with the tools being used. Teachers who are themselves uncomfortable using iPads, applications, and digital curriculum are far less likely to reap the potential benefits (Aubusson et al, 2014). Many programs require the teacher to administrate content or monitor student interactions. Without teachers who are knowledgeable and adept at manipulating these programs, students can be off-task and wasting valuable learning time (Barbour & Reeves, 2009).

The link between student engagement and technological devices is a strong one (Gray & DiLoreto, 2016). However, there is little evidence that teachers on a grand scale are receiving sufficient professional development to properly integrate 1:1 devices (Aubusson et al, 2014). Students could possibly be benefitting from their schools' device programs to a far greater degree than they are currently. Schools and school districts which embrace technology do not always reliably utilize it for its maximum potential (Mills & Exley, 2014).

Motivation, With or Without Devices

The students most likely to spend a substantial amount of their day interacting with a device are those students considered to be at-risk. Low-income children, and those with behavioral and learning disabilities are far more likely to be required to complete some or even all of their school day in front of a screen than their middle class and general education peers (Rauh, 2010). Virtual education is one way to isolate students who may be perceived as higher-maintenance for teachers, paraprofessionals, and administrators while still technically providing services (Rauh, 2010). While technology can provide more opportunities for students to

authentically and enthusiastically engage with their learning, simply placing a student in front of a device with well-designed digital curriculum is not sufficient for engagement or academic success (O'Toole & Absalom, 2003; Ciampa, 2013).

The students who are the most successful in technology-based learning environments are those who are most likely to be successful in traditional learning environments (Barbour & Reeves, 2009). Intrinsically motivated students will outperform students who tend to struggle. While technology provides opportunities to engage students, the simple presence of technological devices does not automatically increase engagement (Barbour & Reeves, 2009). The combination of thoughtful, dynamic teaching and careful integration of devices is what is necessary for proper utilization. However, this is often not the case. Tablets are outstanding tools, but active teaching is still a vital component (Gray & DiLoreto, 2016; Ciampa, 2013).

Classroom Management and Teacher-Student Relationships

Relationships between teachers and students are of utmost importance to the school experience. Strong relationships heavily influence students' satisfaction in school. Students who perceive that their teacher cares about them and their learning often perform better in school (Klem & Connell, 2001). This is true in a traditional brick-and-mortar classroom as well as in digital-only platforms.

A key shift with the advent of technology in the classroom has surely been how teachers manage their students along with their classroom devices (Gray & DiLoreto, 2016). While certain behaviors such as talking out of turn, or not engaging in classwork are often apparent to teachers it is far more difficult to ascertain whether a student is correctly engaging with their tablet. From a distance, a student practicing math facts looks exactly like one who is playing an off-task game. Like any sort of student management in any sort of classroom, the teacher's

relationship with her students is a key component (Gray & DiLoreto, 2016; Klem & Connell, 2001).

Background and Need

Technology and Student Engagement

Teachers, parents, and other decision-making adults understand the powerful sway that technology can have over students. It is apparent, too, that this power can be leveraged to increase engagement in schoolwork (Smith, 2014). With training, thoughtful planning and implementation, and creativity, 1:1 devices are outstanding tools to increase student engagement in classrooms.

One of the distinct advantages technology has presented to schools and school districts is an increased flexibility (Barbour & Reeves, 2009). Schools can offer coursework in which too few students might be interested, or for which there is no qualified teacher available (Barbour & Reeves, 2009). Increased choice is a substantial benefit of educational technology. This potential for greater variety of coursework and student choice is also a key component in students' engagement and motivation (Gray & DiLoreto 2016, Skinner & Belmont, 1993).

Students collaborating can also increase motivation in the schoolwork (Thomas & Hofmeister, 2001). Strategies such as digital message boards, classroom blogs, and other interactive platforms that let students communicate with their peers have been found to have positive outcomes for students (Cook & Oliver, 2001). These provide novel, relevant means for students to communicate with one another while still under the careful supervision of their teachers (Thomas & Hofmeister, 2001).

Motivation, With or Without Devices

Proper supervision and adult interactions are a key component in increasing the motivation of students in all facets of the school experience (Barbour & Reeves, 2009). These types of strategies can be applied to technology-based classrooms as well. It has been established that some students are more engaged with their work using technology and 1:1 devices (Rauh, 2015). However, that does not completely fill the motivation gap (Barbour & Reeves, 2009). Quality classroom management and feedback, combined with thoughtful use of technology, may help students who are traditionally less motivated.

Accountability is closely tied to motivation. Digital platforms allow for a new type of accountability concerning how students choose to spend their work time. As seen in this study, teachers can directly observe how many minutes students are actually spending on the task at hand. This gives them a clearer picture of what is occurring in their classrooms and with their students' work.

Device-based interventions are more likely to be used on students classified as "at-risk" (Rauh, 2015). Quality management and interaction with their teachers helps to ensure that these students are not simply left to their own devices with the iPad or computer replacing actual instruction. As will be discussed later, interpersonal relationships between teachers and students are critical for students to feel connected to their school experience (Gray & DiLoreto, 2016). For at-risk students in particular, quality relationships at school are paramount for success, in school and beyond (Gray & DiLoreto, 2016). For these students in particular, active teacher participation is an important ingredient for success. While iPad-based interventions may be effective for academic skills, for motivation and students' feelings of connection with school, they are not sufficient.

Classroom Management and Teacher-Student Relationships

There are multiple ways for the teacher-student relationship to manifest itself in the realm of technology and digital curriculum (Zheng & Warschauer, 2015). In a technology-based classroom, the student is interacting with a device as well as with their instructor. The degree to which teachers interact with their students through the technology can have positive benefits for student-teacher relationships (Gray & DiLoreto, 2016). Technology can be a tool for teaching, not a replacement for a teacher. It is apparent that even in a more digital environment, the teacher's presence and relationship with her students is still crucial (Zheng & Warschauer, 2015). Technology can be used to establish the student-teacher relationship in a new and different format that is still beneficial to the student (Gray & DiLoreto, 2016).

Over courses that are taught exclusively through digital mediums, students reported a greater degree of perceived learning when they felt more connected to their instructor (Gray & DiLoreto, 2016). Communications such as emails, text messages, phone calls, and Skype aided in students feeling that they had a stronger and more meaningful relationship with their instructor (Rock, et al, 2013). Students feeling more connected with their peers also contributed to greater satisfaction with online learning (Thomas & Hofmeister, 2001).

Purpose of the Study

The purpose of this study was to determine the effects of teacher classroom monitoring regarding on-task behavior of students during an iPad based intervention for sixth grade students in a rural school setting. Two different styles of classroom management were compared to see if there was a measurable difference in three measurable indicators of student engagement.

Technological devices in the classroom can be powerful learning tools for increasing academic engagement in students (Falloon, 2015). It is unclear, however, if certain methods of

teacher feedback and interaction is more beneficial for students remaining focused on their work, rather than the temptations of the wider internet. One-to-one devices, such as iPads, could help engage and motivate students. This effect can be maximized with proper classroom management and teacher interaction (Falloon, 2015, Gray & DiLoreto, 2016).

The study was expected to find that in-person interactions with the teacher were more effective for keeping students engaged in their iPad intervention. Interacting face-to-face, discussing the work, and forging a meaningful relationship should help students stay on-task and meeting their time-management goals.

Research Questions

The researcher was hoping to ascertain that styles of classroom management have an impact. Three components of student engagement were identified and used to measure the degree to which students were applying themselves to their classroom work. Specifically, the researcher aspired to find:

What are the effects of teacher classroom monitoring regarding on-task behavior of students during an iPad based intervention for sixth grade students in a rural school setting?

How does teacher monitoring compare to in-application feedback?

Significance to the Field

This study will contribute to the body of literature concerning how best to manage classrooms which are utilizing 1:1 devices for instruction. Students who participate will benefit from receiving a more effective style of feedback during their iPad-based writing intervention instruction. Most of the research concerning students interacting with devices has been conducted in Australia, the UK, China, or the Netherlands. Many schools in these countries

adopted 1:1 devices before it became common in American school districts. This study lends an American perspective to the issue.

The effects of individual iPad applications have been studied; so too, have the effects of different styles of classroom management and engaging students. There does not appear to be a significant amount of work down around tailoring management strategies to the digitally based classroom. This study intended to add a new angle to the existing literature.

Definitions

The following terms are used according to these definitions.

1:1 – One device for every child in a classroom.

Application – A computer program utilized on an Apple brand operating system.

Motivation – A student's intrinsic desire to succeed in school.

Devices – Handheld electronic devices with full operating systems. These include (but are not limited to) Apple's iPad, iPhone, or iPod, Samsung's Galaxy series, other smartphones and tablets.

iPad – Apple's handheld tablet computer. In this study, the 4th Generation iPad was used.

Engagement – "a psychological process, specifically, the attention, interest, investment, and effort students expend in the work of learning" (Marks, 2000).

Active Monitoring – a teacher monitoring her classroom by walking and patrolling around the room and engaging in-person with students

Computer Monitoring – A teacher relying mainly on the tools of an application to monitor the on-task behavior of students.

Real Time - An aspect of the *Moby Max* program which allows teachers to monitor their students' work on the program.

Limitations

A significant limitation to this study is its relatively small sample size. As the study was carried out at a small, rural school, the entire sixth grade only consisted of seven students. While this is a meaningful percentage of the school itself, it is not a statistically substantial enough group from which to confidently extrapolate and apply to the general population or statistical analysis.

Another limitation is within the body of research. Overwhelmingly, the studies which have investigated the impact of iPads and other 1:1 devices on student engagement have been carried out in Australia, the United Kingdom, China, and the Netherlands. While some of these countries are English-speaking and culturally similar to the United States, there could still be a cultural difference which determines effective classroom management and teacher relationship building.

Ethical Considerations

There are few ethical considerations for this study. If one method of management is substantially less effective than the other, then these students were intentionally exposed to a lesser-quality of instruction for a proscribed period of time. The details of the research were submitted to the Internal Review Board at Central Washington University. All research was approved for human subjects by the university.

CHAPTER II:

REVIEW OF THE LITERATURE

Introduction

Technology in the classroom is trending and catching on fast. Research strongly indicates that individual students' devices (1:1 devices) are engaging and, ultimately, academically beneficial. Delivering instruction and practice through a device such as an iPad dramatically reconfigures the classroom. It is still unclear whether the same classroom management strategies that are effective in traditional classrooms are the best practices in a more blended learning environment.

To clarify the literature, three categories of studies were examined for this review. First, literature is used to establish what is known to work in classrooms to engage students, with or without technology. These strategies can be built upon in the technology-oriented classroom. Next, there is a body of literature which establishes that technology can be used to explicitly engage students effectively. Finally, a section of the literature demonstrates that technology can increase academic gains for students and is a worthwhile tool for continued use in classrooms.

Section I: Student Engagement

Student engagement has become an increasingly important priority in the craft of teaching and the design of curriculum and instruction. Substantial research has identified various indicators of both engaged and disengaged students. This helps educators gain a deeper understanding as to what aspects of their students' lives are most likely to affect engagement and how to increase it. This also identifies the importance of engaged students and links engagement to academic performance.

Lewis, Huebner, Malone, AND Valois (2010) explain that student engagement is a monumentally complicated concept. Many factors contribute to a student being an involved learner. This study examines the relationship between a student's overall life satisfaction and both their cognitive and their emotional engagement in the school setting.

While there has been research investigating the effects of adolescents' life satisfaction on various aspects of their social and emotional well-being, surprisingly little has been done to research how life satisfaction impacts school and learning. The participants were recruited from entire grades at a large middle school in the southern United States. Ultimately, 779 completed the return surveys. The school was predominately white, with a substantial Black population. The authors did not examine a specific intervention, but was examining a correlation between two variables.

A survey was administered to the 7th and 8th grade students of the middle school once in the fall of 2008 and again in the spring of 2009. Consent forms were obtained for all participants. The surveys were designed to measure students' life satisfaction, emotional engagement, cognitive engagement, and behavioral engagement. An established scale already existed for measuring student life satisfaction, the Students' Life Satisfaction Scale (SLSS). This data was used to extrapolate emotional engagement. The Student Engagement Instrument (SEI) was used to measure cognitive and behavioral engagement. The results from both the fall and spring surveys were analyzed to extrapolate results.

The analysis revealed that there is a statistically significant correlation between life satisfaction and cognitive engagement. However, there was not a detectable correlation between life satisfaction and emotional or behavioral engagement. After controlling for race, gender, and socioeconomic status, students who believed at the beginning of the school year that school was

meaningful and important for their future were more likely to be cognitively engaged in their schooling.

A key limitation of the study is the reliance solely on self-reporting data. As middle school students may not be particularly self-aware or adept at analyzing their motivations, this data could be skewed. It is also possible the students were concerned about sharing private information with adults affiliated with their school.

Lawson and Masyn (2015) attempt to take a more holistic look at engagement to see how various pieces of students' lives interact to improve or challenge their academic engagement.

The study focused on three separate goals: to evaluate the concept of engagement disposition, to develop models which would enable teachers to modify their instruction, and to explore how difficult it is to predict a student's predilection towards academic engagement.

The data set analyzed here was from a nation-wide longitudinal survey created by the National Center for Educational Statistics. Information from 16,000 10^{th} graders across 750 schools was used. Base data was taken in 2002 and two more data sets were taken in 2004 and 2006. While the survey asks students to agree or disagree to a specific extent (i.e. "strongly agree") the degrees were not taken into account for this study. Variables such as indicators of academic investment and initiative, student ambivalence, and future beliefs were utilized. Specific demographic details such as gender, race, and class were also used to build the model.

Ultimately the researchers chose a model that divided students into six classes of engagement disposition. Six was chosen because it best represented the heterogeneity of various groupings. The student profiles observed included academic initiative, academic investment, low efficacy, boredom, ambivalence, and dis-identification. Demographic information played a role in predicting which students would be classified in each profile.

The results of this study could be used to help schools and teachers identify factors which will likely place students in more engaged categories. Working with these variables may help educators to increase students' engagement overall.

Some key limitations exist when using data gathering for such a large sample. There is no reliable way to completely standardize how each survey was administered.

While research has conclusively shown that teacher interaction and course design impact student learning, this research has not truly been extrapolated to the online learning environment. Gray and DiLoreto (2016) examines which features of online courses increase student satisfaction and motivation and lead to benefits in achievement.

In their work, Grey and DiLoreto (2016) seek to deepen their understanding about engagement and student-teacher interaction online. Specifically, "the data collected from this questionnaire were interpreted to explore the relationships among course structure and organization, learner interaction, and instructor presence which have been reported to affect student satisfaction and perceived learning in online learning environments" (Gray & DiLoreto, 2016, p. 3).

This study (Gray & DiLoreto, 2016) examined university graduate students taking online classes. The professor emailed an online survey to 567 students, with 187 ultimately participating. Each of these students had prior experience taking online courses. The survey instrument was developed by the researchers specifically for this study was titled "The Student Learning and Satisfaction in Online Learning Environments Instrument" or SLS-OLE. Data was analyzed using traditional means and standard deviations.

The researchers found that course structure and instructor interaction had a statistically significant impact on learner satisfaction. More interaction with the instructor was seen as

desirable and positively impacted the students' experiences. A greater deal of course organization and clarity in expectations also increased the students' satisfaction with their learning experience (Gray & DiLoreto, 2016).

It can be concluded from this study that intentional, thoughtful design of online learning environments is beneficial for students and their engagement. Even though the instructor is more remote in an online learning situation, instructors still play a vital role and their students likely want feedback and attention (Gray & DiLoreto, 2016).

As in many survey-based studies, a truly random sample was not used here. Students were invited and then chose to participate. It is possible that students who are more satisfied with their experience would be more likely to be willing to share their thoughts and feelings. Furthermore, this study focused on university graduate students, rather than K-12 students. While some findings surely apply to younger students, naturally there are also profound differences. Graduate students are choosing to further their education rather than the compulsory nature of K-12. This can certainly affect engagement and perceptions of learning satisfaction (Gray & DiLoreto, 2016).

Section Summary

These three articles cover various aspects of the wide topic of student engagement. The Lewis et al. (2010) examined the importance of life satisfaction and its relationship to engagement in school. This highlights the importance of relationships with students in keeping students connected to their school experience. Lawson and Masyn's (2010) work links with this in identifying predictors for both engaged and disengaged students. They identified the deeper factors in students' lives that greatly affect their performance and demeanor in their school environment.

While Grey and DiLoreto's (2016) work uses technology as a lens through which to analyze engagement and satisfaction, it is still primarily about the students' relationship with their instructor and how that affected their experience in the class. This links their research to the other two articles in this section as focusing on student-teacher relationships and factors that are separate from the classroom itself.

Section II: Engagement Through Technology

As 1:1 devices have gained traction in American schools, researchers have begun to investigate whether this confidence has been placed correctly. Many studies have indicated that for both instruction, peer collaboration, and independent practice students are more consistently engaged through a device rather than more traditional pencil and paper methods (Gray & DiLoreto, 2016, Falloon, 2015). These researchers have found students to be more interested and spend more time on-task completing their work through the use of classroom technology.

Sessions, Kang, and Womack (2016) investigated the efficacy of iPad-based writing instruction. They compared writing samples from students taught using a technology integrated method to those taught in a more traditional manner. There are many benefits to teachers for using devices in the instruction of writing, such as easier organization. However, that does not strictly mean that iPad-based writing instruction is better for students.

The authors investigated two major research questions. First, "Are there differences in student writing, especially in visualizing sequencing, or incorporating sensory details, depending on whether they used iPad apps or paper and pencil? (Sessions, Kang, & Womack, 2016, p. 220). Secondly, "What are, if any, the influences of iPad apps on student's attitude, behavior, or social relations during the writing instruction?" (Sessions, Kang, & Womack, 2016, p. 220).

The students observed for this study consisted of a class of 5th graders in an unnamed town in the western United States. The school breaks down students into different groups based on school arrival time (age, ability, and other demographic details do not determine the grouping) which the authors used as a natural way to sort their sample students. In all, 30 students participated in the study (Sessions, Kang, & Womack, 2016).

Both groups of students were instructed through three units of study in writing. One groups used iPad applications to assist in their writing, while the other group used only traditional paper and pencil. The iPad applications included Paper, Tamajii, Dragon Dictation, Toontastic, Popplet, and Story Builder (Sessions, Kang, & Womack, 2016). Overall, the instruction administered for the study took place over the course of nine weeks.

Participants were grouped according to their arrival time at school. The school involved had an option for students to arrive at school early and leave early, and a later arrival/departure option. This evenly divided the 5th graders into two groups, which the authors capitalized upon. Furthermore, three students in each group was chosen to serve as a case study; these students were not aware of their enhanced role. For each group, an on-grade level, below-grade level, and above-grade level students was chosen to case study (Sessions, Kang, & Womack, 2016).

The researchers analyzed student writing samples. All samples were evaluated in accordance with the Common Core State Standards for 5th grade. Students also engaged in a meta-analysis of their writing process and recorded these thoughts in journals. Student interviews were another key piece of evidence. The interviews, journals, and writing samples were coded looking for key words and phrases concerning the visualization and sensory details of the students' writing. The interviews also gave students the chance to explain pieces of their writing and/or journaling that may have been unclear (Sessions, Kang, & Womack, 2016).

The researchers noted that there were few substantial differences between the two tracks until approximately four weeks into the study. It appears that the students in the iPad track were doing better in the sequencing and logical ordering of their writing (Sessions, Kang, & Womack, 2016). Both groups saw substantial improvements in their use of visualization and sensory detail. Writing transitions also improved in the iPad group. Essentially, some of the apps used allowed students to make out their story ideas more visually which gave them greater inspiration for writing.

Students reported feeling more successful using the various iPad apps to map out their ideas for writing. Many of the 5th graders reported substantial differences when compared to past writing endeavors (Sessions, Kang, & Womack, 2016). This could lead to a long-term increase in writing motivation and confidence for students. These iPad applications could be highly useful tools for teachers in the instruction of writing.

The most apparent limitation of the study is in the grouping of students. While the authors did due diligence in ensuring that there was not a substantial difference in previous writing ability in the two groups, the fact remains that the tracks were not randomly assigned. The school identified parent preference as the greatest factor in determining in which track a student was placed (Sessions, Kang, & Womack, 2016). Other factors such as relationships or employment opportunities could have been skewing these parents' preferences, and therefore the data.

Social media interactions are a major function of technology in the lives of students. The study from Zheng and Warschauer (2015) examines social media-style discussion forums as a vector for writing practice and instruction. Writing achievement is also a major component of the achievement gap between white and Black students in the United States.

The study addressed four research questions: "1. How did students' participating evolve over the year-long period during which they participated in this online discussion environment? 2. How did students' interaction patterns change between the first two months and the last two months? 3. How was students' writing/reading proficiency (as measured by their writing/reading pre-test score) related to their participation? And how was this relationship moderated by students' English proficiency level? 4. How was students' participation related to their writing/reading proficiency (as measured by their reading/writing post-test score)? And how was this relationship moderated by students' English proficiency level?" (Zheng and Warschauer, 2015).

The study examined 48 fifth graders, of whom 36 were identified as English Language Learners. The students had been using 1:1 laptop computers for a year in school before the beginning of the study. For the purposes of data analysis, students were classified as Fluent English Proficient (FEP), Limited English Proficient (LEP), or Native English Speakers (NES). The classrooms were already using a Writing Workshop model. For the study, two 20 minute sessions of online discussion activity were inserted each week. *CoverItLive* was the online tool used in the discussions. The sessions were included in instruction from September of 2009 through May of 2010 (Zheng and Warschauer, 2015).

In order to measure student progress, the Colorado Student Assessment Program (CSAP) scores were used, along with the number of posts as an independent variable. Hierarchical linear modeling was used to analyze the data for the third and fourth research questions. English proficiency and socioeconomic status were considered during the data analysis (Zheng and Warschauer, 2015).

The NES and FEP students made far more discussion posts than their LEP peers. Initially, the NES and FEP groups grew faster, but the LEPs' growth rate accelerated in the spring. While many of the posts were teacher centered at the beginning of the school year, the focus shifted to the students later on. Standardized test scores were significantly predictive of a student's participation in early discussion posts. Though slight, there was a measurable effect of participation on end-of-the-year test scores (Zheng and Warschauer, 2015).

The data suggests that increasing students' participation in forums such as online discussions, could have positive outcomes for student achievement. While not strictly a limitation, it would be interesting to see the results of a similar study with a control group of students who did not participate in a digital discussion board (Zheng and Warschauer, 2015).

As schools advance into the 21st century, digital tools are more and more vital. Smith's (2014) study examines a virtual science curriculum used for an intervention with elementary school students. The research questions focused on "1) do pre- and post-content tests show significant learning in the virtual environment; 2) are students academically engaged during the learning process; and 3) are students actively demonstrating relevant 21st century competencies" (Smith, 2014, p. 124).

The students selected comprised 15 fourth graders from the American Midwest. The study did not offer any demographic information concerning the students. The intervention used was the Quest Atlantis software, a virtual science game from Arizona State University (Smith, 2014). It was administered as a learning center during the morning work time. The students had used other modules from *Quest Atlantis* before, and were familiar with its mechanisms. Teachers did not give prompts while students were working. Pre- and post-tests were used to assess student progress. The study also used an interview component with teachers in the United

States, United Kingdom, and Australia who are using the program in classrooms. Another component included an engagement survey for the students (Smith, 2014).

The study showed that virtual games are useful for students learning content. The analysis of the engagement survey results with the test data showed a correlation between engagement and achievement in the new science content. The study's findings also indicate that virtual environments are more engaging for students. The teacher interview component found that teachers believed the program was beneficial for classroom instruction. This has implications for classroom management and procedures (Smith, 2014).

The chief limitation of this study is its reliance on self-reported data, which is not always reliable. The window for the study was only five days. A longer study would be illuminating as to the nature of long-term virtual game interventions (Smith, 2014).

Section Summary

All three of these studies examine successful examples of students being engaged and even thrilled and entertained by their work on a classroom device. Sessions and colleagues (2016) showed great benefits from utilizing writing apps in the classroom. They clearly identified the apps' ability to enable students a clearer visualization for their narrative writing. The fourth graders examined by Smith (2014) also absorbed content and reported a greater degree of engagement. It should be noted that this study did not have a more traditional science curriculum to compare to the *Quest Atlantis* program.

Zheng and Warschauer (2015) make a strong case for engagement in technology. As their year-long study progressed, they saw a substantial improvement in students who were more likely to be less familiar with the technology involved. This touches on the crucial issue of

digital citizenship, and technology in the classroom being vitally important for imparting students with necessary lifelong skills.

Section III: Successes with Technology:

Separate from the notion that technology and 1:1 devices can be more engaging is the idea that these tools lead to tangible achievement gains for students. There is a body of literature strongly demonstrating that greater progress is possible to achieve through software programs and iPad applications. These articles make the case that iPads in the classroom are important to study and are worthwhile tools. Studying the management of devices is necessary because they have already been proven to be of use.

As technology-aided instruction becomes more and more common across schools, it is not completely clear how these trends effect students with disabilities. Straub and Vasquez (2015) were concerned that students with learning disabilities (LD) might be left behind by the technology revolution.

The authors leveraged strategies known to be effective for students with disabilities, such as self-regulated strategy development (SRSD) to see if a writing program could be devised which would benefit students with LD. Synchronous instruction, such as video chatting, have been demonstrated to be more effective for students with special needs compared to receiving instruction and feedback exclusively in writing, as is common in many virtual learning environments (Straub & Vasquez, 2015).

Participants for the study were selected for being of adolescent age and having been diagnosed with a language-based LD. Four students, ages 13-16, were selected (Straub & Vasquez, 2015). The grade range was even wider, with the youngest in 6th grade and the oldest

in 10th. All four students were identified as Caucasian and performed below the 30th percentile in writing (Straub & Vasquez, 2015).

The intervention studied here involved several digital components. Instruction was delivered via video conferencing software, Google docs spreadsheets were used to track goals and personal data, Google docs was used to enable writing collaboration, digital quizzing was used to reinforce concepts, and video and audio recording of instructions were available for students to revisit(Straub & Vasquez, 2015).

Five lessons were administered to the students over the course of a week. At the end of the lessons, students had produced an essay which could be compared to a recent writing sample. These essays were evaluated for specific essay elements and quality score (Straub & Vasquez, 2015). Several researchers evaluated the baseline essays and the post-intervention writing work. These judges had agreed with one another approximately 85% of the time. Overall, the students' writing was found to have significantly improved after the intervention (Straub & Vasquez, 2015). The system used in this study was methodical, intentional, and detailed. This could be widely applied to students with LD, many of whom struggle to express themselves in writing.

The chief limitation of this study was its small sample size. Four students is not sufficient evidence to apply to the wider population of students with LD. Another potential weakness in the study is the use of subjective criteria to judge student progress. While the researchers were fairly consistent with one another in their assessment of student work, there was still variability which could skew results (Straub & Vasquez, 2015).

As 1:1 devices sweep across America's classrooms, the adoption of the technology outpaces the research into its efficacy. Falloon (2015) examined blended learning models from

classrooms which used their iPads in collaborative settings. This addresses many of the issues raised with the efficacy of 1:1 iPads in school districts.

The research question for Falloon's analysis were as follows: "1. What design and technical features of iPads and apps appear to support work collaboration in three primary classrooms? 2. How do student perceive these features as supporting, or not, work collaboration?" (Faloon, 2015).

Falloon (2015) surveyed students from over 100 primary schools in New Zealand over the course of three years. The students were enrolled in grades 3-6, approximately ages 8-12. The survey was administered online, on the very iPads that Falloon was investigating. Most of the students took the survey in class, although some did choose to take it at their homes. The younger students completed it as a class activity due to some concern about the reading comprehension level of the students. The grade 5 and 6 students took the survey independently (Falloon, 2015). The data from the surveys were compiled using a mechanism within the survey software and then compiled into Excel spreadsheets. Responses were coded into various categories in order to codify the data (Falloon, 2015).

The data indicates that iPad applications such as Google Docs were helpful in increasing student collaboration on their schoolwork. In his discussion, Falloon focused on two different types of collaboration. The iPads helped students collaborate on their work together in the classroom, but they also helped students collaborate from various locations. For example, a student who had to stay at home due to illness could still participate in assignments via the iPads and Google Docs (Falloon, 2015).

There are some very positive implications for distance learning students or students who are medically unable to attend a traditional brick and mortar school. These children could still

participate in dynamic group work. There are also great implications for students who are not yet proficient in English. Using iPads allows more written collaboration as opposed to purely spoken words, which can be a more reliable means of communication for ELLs.

A serious limitation of the study is contained in Falloon's research questions. He focuses on the appearance and perceptions of collaboration, rather than attempting to objectively measure them. Another potential weakness is the inconsistency of the surveys. Some students took them on their own, some had a great deal of help from their peers and teachers, and others took the survey at home. A final limitation is that the research took place in New Zealand, which is culturally similar to the United States, but still has profound differences (Falloon, 2015).

As in most areas of educational research, the studies for children with challenging or unusual behavior lag behind those for general education students (Straub & Vasquez, 2015). One of the many reasons 1:1 devices are so popular with schools is its ability to reach students with disabilities or behavior difficulties. Flower's (2014) study investigates using iPads during independent work time, a notoriously difficult part of the day, for students who struggle with on-task behavior.

This study compared students with long-term challenging behavior in two different independent work environments. While the classes contained whole group and small group instruction, independent practice was the major focus of the study (Flowers, 2014). The observations took place at school which also served as a residential facility in Texas. The three students studied were all boys who had been diagnosed with Emotional Disturbance (ED). Each student used their own assigned iPad. The iPads contained applications to aid in the practice of reading and math. Each of the apps utilized gave immediate feedback to the student (Flowers,

2014). The study used an alternating treatments design to test the efficacy of the iPads when compared to more traditional pencil and paper independent work.

On-task behavior was measured as the dependent variable. The author defined on-task behavior as "eyes directed at the worksheet or the pencil moving on paper. . . or eyes directed at the iPad screen or the finger moving on screen. . . without talking to other students." The on-task time was measured in 10-second intervals and coded as on-task or off-task. This data was presented as the percentage of time a student was on-task (Flowers, 2014).

All three of the students measured significantly more on-task time while using an iPad than with the more traditional pencil and paper method. In a follow-up interview, each of the students indicated that they enjoyed doing their independent work on an iPad more than on a worksheet (Flowers, 2014). This suggests that iPads might be a great tool for focusing students with ED during their independent practice time. Theoretically, more time spent on task would equate to gains in academic achievement.

A notable limitation of this study is the small sample size. Three students is not a large enough group to be able to extrapolate to the general population of students with ED. All of the participants were boys, which also excludes half of all students. The definition of on-task was rather broad, which means that some time could have been coded as "on-task" which was not truly academically productive.

Ciampa studied the relationship between mobile devices in classrooms and student motivation. The single-subject study interviewed one 6th grade teacher and 10 6th grade students about their perceptions around devices and motivation in their classroom. The author identifies "challenge, curiousity, control, cooperation, competition, and recognition" as key elements of motivation (Ciampa, 2013, pg. 82).

This qualitative study took place in self-contained 5th and 6th grade classroom in a small, rural school. This is similar to the setting of the study detailed in this thesis. Data was collected through interviews and classroom observations. The teacher also maintained a research blog throughout the process. The findings from this study were nuanced, but essentially were consistent with mobile devices increasing the motivation in the 6th grade students.

Limitations with this study include those inherent in all qualitative studies, it relies heavily on honest reporting and self-awareness. Ten students and one teacher is also an extremely small sample size, which makes extrapolating results to the general population unreliable.

Section Summary

These studies all describe interventions that were successful not only in increasing student engagement, but yielding statistically significant improvements in academic achievement. This gives weight to the importance of studying devices in the classroom, as they are valuable tools for increasing opportunities for students. Two of these studies, Straub & Vasquez (2015), and Flower (2014) focused on students with disabilities. This demonstrates the versatility of 1:1 devices as a tool. They have benefits for all students.

Falloon's (2015) work adds to the potential positive consequences of iPads. He found not only an increase in academic achievement, but in desired behaviors such as collaboration as well. The last section of the literature demonstrates that 1:1 devices can be great forces for positive change for students and are well worth the time and effort to manage correctly.

CHAPTER III:

Methodology

Introduction

Technology, specifically the use of 1:1 devices in classrooms is a relatively unexplored development in education. The efficacy of technology-based interventions, along with their use as tools for engagement, has been investigated (Straub & Vasquez, 2015). However, little has been done to ascertain which classroom management strategies are most advantageous for keeping students engaged.

The researcher attempted to answer the following research questions:

1) What are the effects of teacher classroom monitoring regarding on-task behavior of students during an iPad based intervention for sixth grade students in a rural school setting?
2) How does teacher monitoring compare to in-application feedback?

The study relied on a quantitative quasi-experimental design. The same group of students was exposed to two different styles of classroom management while utilizing an iPad-based intervention. Data was collected pertaining to their on-task behavior for each style. The amount of time spent engaging with the intervention was measured using tools within the digital application. Data was collected for each type of management strategy during three separate sessions for each style.

Setting

This study took place in a small, rural K-12 schoolhouse in the mountains of Washington State. Unemployment was high in the community, and many adults who did work commute long distances to their jobs. There was no grocery store, medical clinic, or county government offices

in the community. For nearly all services, residents would drive to the nearest town, 15-20 miles away.

The school has just over 100 students in the district. Of these, nearly 67% qualify for free or reduced lunch. Approximately 25% of the students were Hispanic/Latino, 2% Black, 4% Native American, and 67% White. 15% of students were classified as English Language Learners. The school district employed 10 full-time teachers for all grades, Kindergarten through 12th grade.

The intervention was conducted during the usual 6th grade instructional block. This was one of the only parts of the day where the students were instructed as a single grade, as opposed to a multi-age grade setting. Instruction took place in the 5th and 6th grade classroom. It is a large room, with four tables which usually seated 4-5 students. A fifth table, raised to accommodate students working while standing, sat in the middle of the room. Students were permitted to switch to this table if they felt they would be more productive while standing. Other alternative seating arrangements included beanbags, pillows, and quiet zones which students could select on their own to use. There was also a small trapezoid-shaped table at the front of the room for small group instruction. The room was equipped with its own bathroom.

Participants

Due to the small size of each grade level at the school, the researcher chose to simply use an entire grade level as the sample. With seven students, the 6th grade provided a manageable sample size. The 6th grade also had a wide variety of student abilities which would provide for a deeper understanding of the effects of the intervention on a variety of learners. Each of the students spent the majority of their school day in the self-contained combined-grade 5th and 6th

grade elementary classroom. This class was led by one teacher, with occasional pull-out support from a paraeducator.

All seven of the students in the participant group were identified as White. Three were girls, and four were boys. Two of the students have spent all of their school years at the same school. Two of the students were on Individual Education Plans (IEPs) and one was transitioned off of an IEP about 18 months prior to the study. All seven students were in the 6th grade at the time of the study, with the expectation of transitioning to 7th grade. Each of the students had at least one year of experience using the 1:1 iPads utilized in the study.

The participating teacher was also White. She was in her early 30s and had been teaching for five years, three of them at the school where the study took place. She was not originally from the area in which the school was located.

Intervention

Moby Max was a digital curriculum program that the host school paid a substantial annual subscription fee in order to use (Moby Max Customer Service, Personal Communication, May 2, 2017). It delivered instruction and review in a variety of subjects, including, math, science, social studies, literacy, and reading fundamentals. *Moby Max* tracked students' progress across the variety of skills and subjects. It includes a mechanism so that teachers may look back on their students' correct and incorrect answers and evaluate next steps.

Furthermore, a feature of the program, "*Real Time*" lets teachers monitor their students' activities within the program. *Real Time* informed teachers which screen their students were interacting with, how long they have spent on their current problem, and whether the students had gone off task. Teachers also had the ability to send messages to their students within the *Moby Max* program. Due to the *Real Time* feature, teachers could theoretically manage their

students' on-task behavior from a computer station. Within the program, teachers can both determine that their students are not on-task and prompt their students to return to their work from their own desk.

The more traditional classroom management technique would require the teacher to walk around the classroom, investigating student screens, and prompting students verbally to return to their work if they are not on-task. Without returning to her desk periodically, the teacher would not know if her students were consistently on-task during the time when she was not observing them.

The two different styles of management comprised the independent variables in the study. The dependent variable is the amount of time, as measured by *Moby Max*, students spent engaging with their iPad-based intervention. It is crucial to note that this study measured only student engagement, not achievement.

Materials

The key materials utilized by this study were the 1:1 student iPads provided by the host school. The *Moby Max* program was also paid for by the host school district. The program specifically utilized in this program was *Moby Max's* digital curriculum to practice aspects of English grammar. All seven of the students included in the study had a great deal of exposure to both the iPads and the *Moby Max* program before the study.

Measurement Instructions

The chief measurement instrument in the study was the *Real Time* feature within the *Moby Max* program. Specifically, the researcher used the number of active minutes logged by each student during the time they were supposed to be logged in and working on the *Moby Max* program. The program also kept track of time when a student was inactive for a long enough

that the program deemed them to be off-task. This length of time was set at 60 seconds by the researcher. It is important to note that overall time engaged with the program was measured in minutes, while the time within the program judged to be off-task was measured in seconds.

The second measurement instrument was the number of corrections given to students throughout each 20-minute period. Corrections would only be given to students who the teacher or the *Moby Max* program judged to be off-task.

The validity and reliability of the *Real Time* was established by the software manufacturer (Moby Max Customer Service, Personal Communication, May 2, 2017). However, outside variables such as the speed and reliability of the school's internet connection could have affected results. The researcher had used the *Real Time* feature of *Moby Max* as a teacher for three years at the time the study was conducted.

Procedure

On ten different days, the students participated in a 20-minute language session with the *Moby Max* curriculum. During five of these sessions, the teacher physically monitored the classroom. This involved her looking at student screens and prompting and redirecting students who were not correctly utilizing their time. Each time a student required correction or redirection, it was recorded and counted. Incorrect utilization could include not using the correct application or website, focusing on something besides the iPad, or interacting with peers.

During the other five sessions, the teacher managed the classroom exclusively from her computer station. Using the data provided by *Moby Max*, the teacher corrected or redirected students who had been off task for at least 60 seconds. During these times prompts would be given via the *Moby Max* program for students to return to their work and focus on the task at hand.

The prompts given to off-task students were as follows:

Option 1) Let's refocus on your work please

Option 2) It looks like you are not on task, let's get back to work please.

Option 3) [Student's name] Time to work on your Moby.

Regardless of whether the prompt was given out-loud and in-person or via the *Moby Max* program, one of these three scripted options was used to redirect students.

The five sessions for each style of management were administered consecutively, rather than alternating between the two different management styles. This allowed the students to get more comfortable with each style and perhaps behave more as they would in an intervention that would be administered every day.

At the end of each of the sessions, the amount of time logged as participating on the *Moby Max* program was recorded. Additionally, the amount of time the program deemed the student to be off-task was also recorded.

Data Analysis

Three pieces of quantitative data were collected from the study. To compile and analyze the data, the researcher averaged the five sessions' time spent engaging with *Moby Max*, their time designated as being off-task, and the number of corrections required by each student. The averages from each of the management styles were used in a t-test analysis to determine whether there was a difference between the averages found from the different samples. A separate t-test was performed for each of the three categories of measurement. In studies determining statistical validity in education, a significance level of $a = 0.05$ is often the threshold for statistical significance (Bui, 2013). Charts and graphs were provided to allow readers to visually analyze the data.

Chapter Summary

In order to gain more insight into effective classroom management with 1:1 devices, the researcher designed a study to examine two different management strategies. One management strategy involved the teacher physically walking around the room interacting with students. The second required the teacher to remain at her computer and use the information from the *Moby Max* application to make management determinations.

After completing five sessions utilizing each management strategy, the averages for three measurable outcomes were calculated. The number of corrections given to each student, their Focus Time, and the number of minutes logged were each recorded. A *t*-test was used to determine if there was a detectable difference between the two strategies.

CHAPTER IV:

Results

Introduction

In order to examine the effect of a teacher's physical presence around the classroom, rather than in one location, seven 6th grade students were studied. The students were examined throughout 10 sessions using a reading and language intervention through the *Moby Max* online curriculum program, administered on iPads. Each session lasted for 20 minutes and was monitored by the teacher in one of two ways.

During five of the sessions, the teacher physically monitored the classroom. She was out of her seat, walking throughout the room, glancing at the screen of each student's iPad. Behaviors such as talking to neighbors, not focusing on work, or spending time on the incorrect website could be observed and corrected.

Throughout the other five sessions, the teacher remained at her seat in front of a computer screen, observing the data from the students' work on their intervention. This included how long students had spent on their current question, how long they were actively logged in, and what question was currently being answered. The teacher used an in-program message system to correct students whose data indicated they were not productively using their time.

A *t*-test analysis was performed on the data from each of the measurement instruments. The data was varied in its results.

Number of Corrections

The number of corrections the teacher made for each student was recorded. When students were perceived to be off-task, the teacher prompted them to re-focus on the work on the

iPad. After the sessions were completed, the mean average was calculated for each student across the five sessions of each type of management.

Table 1

Number of Corrections Required for Physically Monitored Sessions

Student	Session #1	Session #2	Session #3	Session #4	Session #5	Average Number of Corrections
A	0	0	0	0	1	0.2
B	2	1	1	2	2	1.6
C	1	0	0	0	0	0.2
D	1	2	1	4	2	2
E	0	1	0	1	0	0.4
F	ABSENT	1	1	1	2	1.25
G	1	1	0	2	1	1

Tables 1 and 2 demonstrate the number of corrections for each student for each session of intervention as well as the average number of corrections for all five sessions. Figure 1 offers a visual comparison of each student's average number of corrections for the actively monitored sessions, compared to the average number of corrections for the computer monitored sessions. Table 3 shows the average for all seven students across all five sessions.

Table 2:

Number of Corrections Required for Computer Monitored Sessions

Student	Session #1	Session #2	Session #3	Session #4	Session #5	Average Number of Corrections
A	1	0	0	1	0	0.4
B	1	0	0	0	0	0.2
C	1	0	0	0	0	0.2
D	3	0	1	0	2	1
E	0	0	ABSENT	0	0	0
F	ABSENT	0	1	0	0	0.25
G	1	1	1	1	1	1

Students C and G both had the same average number of corrections across both management styles. While they both did not appear to experience any significant change due to the type of supervision, their individual data was wildly different. Student C had only a single correction in either type of session (although as will be seen later: the lowest level of focus). Student G, on the other hand, had at least one correction during nearly each session.

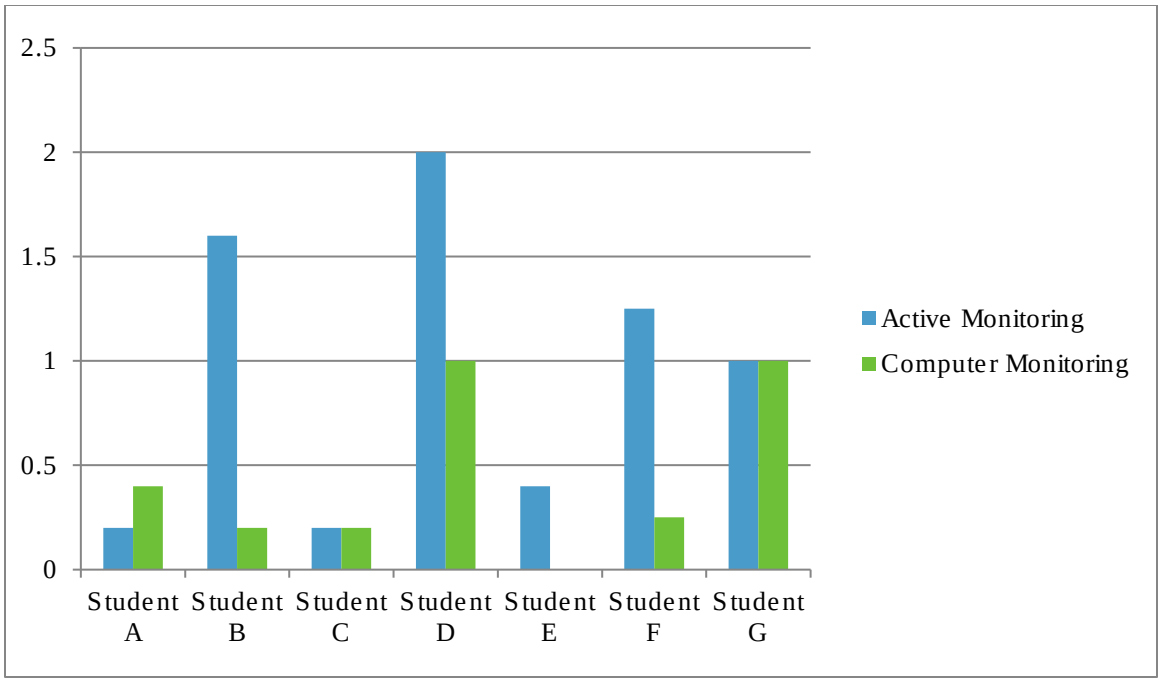

Figure 1: Comparison of Average Number of Per Student Corrections over 5 Sessions.

Out of the seven 6th grade students, four had fewer corrections with the teacher using *Moby Max*'s data to monitor the classroom. One student had more corrections during the computer monitored sessions, and two students had the same amount regardless of the management style. Three of the four students who were corrected more often during the physically monitored sessions saw a substantial increase in corrections during computer monitored sessions. These three students were corrected more than twice as many times than they did when computer monitoring was utilized. While Student A received twice as many corrections during the computer monitored session, the only student to see an increase during this type of management.

Table 3:

Average Number of Corrections During a 20 Minute Timed Session

Actively Monitored Session	Computer Monitored Session
0.95	0.44

The *t*-test analysis determined the statistical significance of the data for the number of corrections during the sessions. It compared the actively monitored sessions (M=0.9500, SD=0.71239) and the computer monitored sessions (M=0.4357, SD=0.40282). This test did not find the data to be meaningfully different as $t(6) = 2.194$, $p=0.71$, $d=0.5$. This indicates that neither management style led to any real change in the number of corrections for the whole group.

Minutes Logged

Each of the ten sessions was timed for 20 minutes. The timer was set as soon as each student had logged in the *Moby Max* program. Students who were not attentive to their work for at least 60 seconds were not give credit for that minute within *Moby Max*'s program. For example, if a student has another tab open in their web browser in which they are reading or engaging with, the time spent on the other website would not register in their logged minutes with *Moby Max.* Time spent idle, such as daydreaming, would also not register. A drawback to this method is that a student concentrating fiercely on the problem in front of them, but not engaging with the screen to seek help from the program, would also be counted as idle. To minimize this impact, the intervention assigned consisted of questions that should not require more than 60 seconds of intense concentration.

Table 4:

Number of Minutes Logged per 20 Minute Timed Actively Monitored Session

Student	Session #1	Session #2	Session #3	Session #4	Session #5	Average Number of Logged Minutes
A	18	15	19	16	19	17.4
B	11	18	20	20	19	17.6
C	18	18	20	18	20	18.8
D	20	19	20	20	20	19.8
E	14	18	19	17	20	17.6
F	ABSENT	20	20	20	20	20
G	16	20	18	20	20	18.8

Most of the students were quite consistent in their number of minutes logged throughout the five sessions. Students C, D, F, and G all stayed within the upper teens every time. Students A, B, and E were mostly consistent, but these students each had one session that served as an outlier. For all three of these students, it is notable that the first session that serves as the outlier. This indicates that perhaps the students were flummoxed by the instructions or a change in the format in their typical use of the *Moby Max* program.

Table 5:

Number of Minutes Logged per 20 Minute Timed Computer Monitored Session

Student	Session #1	Session #2	Session #3	Session #4	Session #5	Average Number of Logged Minutes
A	17	18	19	17	17	17.6
B	19	16	18	18	18	17.8
C	16	13	18	17	17	16.2
D	17	ABSENT	20	19	17	18.25
E	15	20	ABSENT	11	18	16
F	ABSENT	17	20	19	18	18.5
G	16	15	14	16	18	15.8

During the computer monitored sessions, the students registered similar amount of time as with the actively monitored sessions. Notably, out of the 32 sessions recorded, only three times did students achieve a full 20 minutes of engagement with the intervention. While being actively monitored, students were measured at the full 20 minutes 16 times. Ultimately, the difference in the average number of minutes logged was 1.41 minutes, or 7% of the timed session.

Table 6:

Average Number of Minutes Logged During a 20 Minute Session

Actively Monitored Session	Computer Monitored Session
18.57	17.16

The *t*-test for the actively monitored number of minutes (M=18.5714, SD=1.07349) and the computer monitored number of minutes (M=17.1643, SD=1.13311) did find a difference,

t(6)=3.006, p=0.024, d=0.05. Active monitoring resulted in students logging more minutes during their intervention sessions.

Table 7:

Difference in average minutes from Actively Monitored Session to Computer Monitored Session

Student	Difference in average minutes from Actively Monitored Session to Computer Monitored Session
A	+0.2
B	+0.2
C	-2.6
D	-1.55
E	-1.6
F	-1.5
G	-3

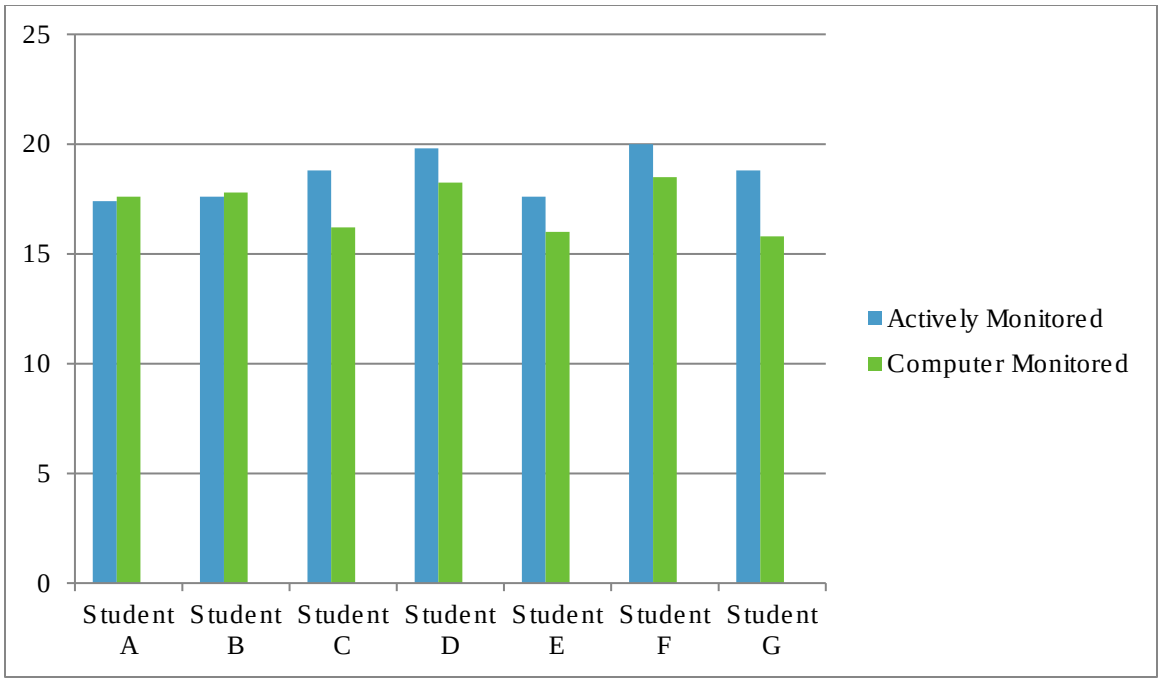

Figure 2: Comparing Number of Minutes Logged from Physically Monitored to Computer Monitored Sessions

Percentage of Focus Time

After each session within the *Moby Max* program, the percentage of time spent "focusing" is determined. This percentage is calculated by determining the number of problems solved under two minutes and then divided by the total number of problems. Again, due to this definition, the Language module was chosen because its multiple-choice problems should be easily solved in less than two minutes.

Table 8:

Percentage of Time Spent Focused During Computer Monitored Session

Student	Session #1	Session #2	Session #3	Session #4	Session #5	Average Percent of Focused Time
A	100	97	100	100	100	99.4
B	89	100	100	95	100	96.8
C	91	97	97	60	73	83.6
D	100	81	100	100	100	96.2
E	100	95	86	100	100	96.2
F	ABSENT	90	100	100	100	97.5
G	96	88	98	100	96	95.6

As demonstrated by Figure 3, three of the seven students were more focused when being actively monitored by their teacher. The remaining four were more focused when the teacher was relying on computer data to monitor their on-task behavior. This does not indicate a clear influence for either style of management.

Table 9:

Percentage of Time Spent Focused During Computer Monitored Session

Student	Session #1	Session #2	Session #3	Session #4	Session #5	Average Number of Logged Minutes
A	100	97	99	96	100	98.4
B	88	98	100	100	100	97.2
C	86	100	79	86	81	86.4
D	77	ABSENT	100	100	100	94.25
E	95	99	ABSENT	100	100	98.5
F	ABSENT	93	100	100	99	98
G	91	86	80	94	94	89

Similar to the number of corrections, the t-test analysis suggests that the varying management strategies did not have significant effect on the amount of time students spent actually engaging with their work t(6)=0424, p=0.686, d=0.5. When compared, the actively monitored percentage of focus time (M=95.0429, SD=5.19675) and computer monitored percentage of focus time (M=94.5357, SD=4.94408) were not meaningfully different.

Table 10:

Average Percentage of Time Spent Focused

Actively Monitored Session	Computer Monitored Session
95.04%	94.5%

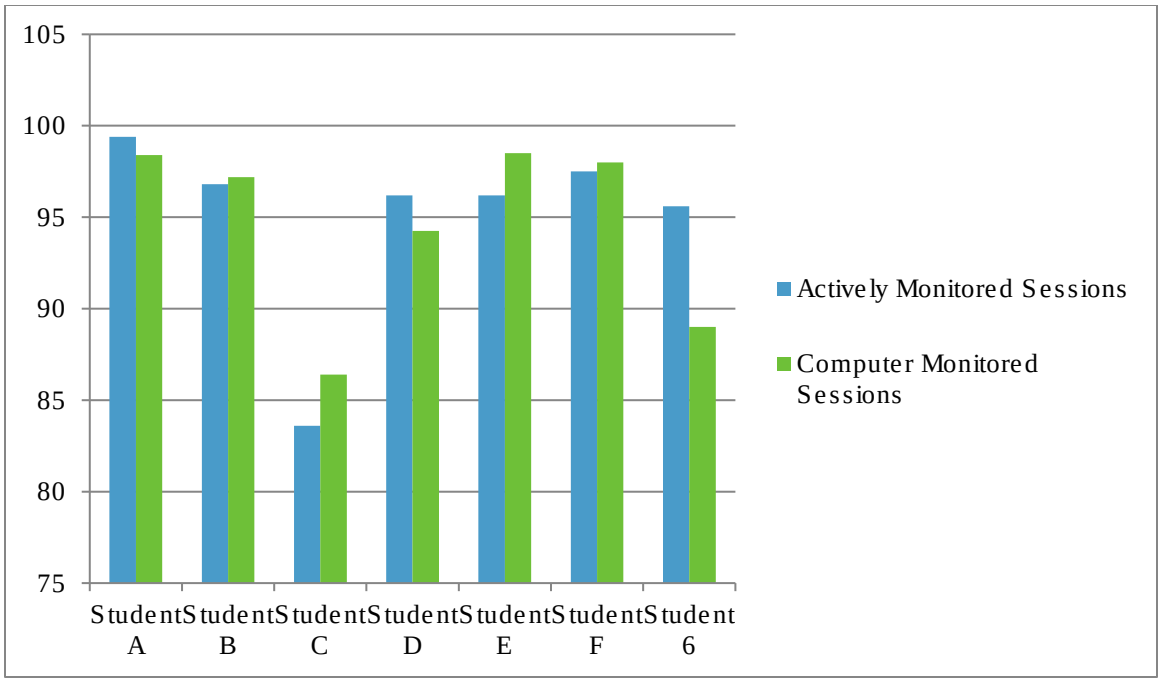

Figure 3: Comparing Average Percentage of Time Spent Focused

Conclusions

Three measurement instruments were used during this study. The researcher tracked the number of corrections each student received during each session, the number of minutes the intervention program registered the students as actively participating, and the percentage of that time the student was engaging with the intervention. Two of the three instruments, the number of corrections and focus time, were not significantly impacted by a different style of classroom management. The second instrument, the amount of time students logged in the program, did show an improvement when the class was being actively monitored.

CHAPTER V:

DISCUSSION

Teachers and schools rely heavily on technology. However, free rein with a device is not beneficial for students or teachers. Many studies have found that technology can be more engaging for students than purely traditional instruction (Selwyn & Facer, 2014). Each teacher has their own technique or strategies for correctly utilizing time on internet-enabled devices.

This study examined two classroom management strategies to see if either made a significant impact on the number of behavior corrections required by students, the number of minutes they logged as being actively working on an intervention, and the percentage of time they spent focused on that intervention. Out of the three measurements, only the number of minutes logged was found to be impacted by the management strategy.

Discussion

The first measurement instrument was the number of corrections made to students' on-task behavior during each 20 minute session. The number of corrections made to students during the actively monitored sessions were compared with the number made during the computer monitored sessions. If one method of management was more useful for keeping students on-task and engaged, it could result in fewer corrections to students. This is by far the most subjective of the measurements. While the number of corrections for most students decreased as they were monitored through the use of the computer application, this was not a significant decrease from the actively monitored sessions. Since the mean differences between the two types of management styles were not significantly different, this measurement instrument does not give a clear sense of which style might be more effective for student engagement.

A possible factor in the decrease of the corrections would be that the visibility of the teacher is limited. While she could tell whether students were accessing the correct screen on their iPads, other undesirable behaviors would be far less obvious. Off-task behaviors such as whispering to neighbors or daydreaming would be less obvious to a teacher who is managing her computer station. As the teacher is more likely to witness off-task behavior when she is physically closer to her students, this could explain the slight (but insubstantial) increase in corrections. The data from this particular measurement instrument were not conclusive enough to determine whether either management style impacted the amount of off-task behavior. Rather, it indicates how much off-task behavior the teacher was able to see.

The *Moby Max* intervention used in this study has a mechanism to record how many minutes a student is engaging with the program during each session. If a student is inert for longer than 60 seconds, the *Moby Max* program will not count that minute as successfully completed. As the students were limited to 20 minute sessions for the purposes of this study, students who logged far less than 20 minutes for each session can be concluded to be spending some time off-task. As the program would occasionally be slow to allow students to log in, a minute record of 18 or 19 minutes is not unreasonable. As with any classroom endeavor, even the most diligent students will likely find their minds wandering when they should be focusing on their class work, so it would be unreasonable to expect 20 minutes of compliance from each and every student for each and every session of intervention.

Notably, Student D did log near perfect minutes for the five actively monitored sessions (Tables 4 & 5). He had four sessions where he logged 20 minutes, and one where he logged 19, which was the highest of the students observed. While he was likely not on task a full 100% of

time, when he strayed from his work, it was not for a significant enough time to prevent the program from recording him as on-task.

As mentioned in Chapter 4, a student who is struggling with the content, but completely on-task could potentially be logged with fewer minutes. A student who was concentrating on a problem and attempting to work it out in their head or on paper for longer than 60 seconds would not be credited for the minute they spent contemplating as they were not engaging with the program on the screen. However, if the student seeks help from the program's video library for assistance, then the time is logged as on-task. This discrepancy is one of the reasons that *Moby Max's* language intervention was selected. The Language curriculum relies mostly on short, multiple choice questions that would not require 60 seconds of concentration for students to attempt an answer.

The number of minutes logged during each session was the only measurement instrument that detected a difference between the two styles of classroom management. Each student was recorded for ten sessions of the intervention, five for each type of management style. The number of minutes logged for the five sessions of each management style were averaged and then compared using a t-test analysis. The data indicates that active monitoring by the teacher increases the number of minutes logged by students during their 20 minute sessions. It is worth noting that it is difficult to determine statistical significance with such a small sample size.

The third measurement was also from within the *Moby Max* program. *Moby Max* calculates what is referred to as "focus" time by dividing the number of problems solved in less than two minutes by the number of total problems. By taking the total number of problems into account, this provides a different look at how students are spending their time within the program. Students could feasibly be off-task for a great deal of the intervention time, but so long

as they interacted with the screen once every 60 seconds, they could be logged as participating for a full 20 minutes. Their focus time, however, would be lower.

While the number of minutes gives the researcher a sense for how much time is being spent with the program, the focus percentage gives a more complete picture of how that time is being spent. A student who has a high focus percentage, as well as a high number of logged minutes, can likely be safely assumed to be mostly on-task.

In the study, Student C's logged minutes were generally towards the middle of the pack; 4th and 5th out of seven students during the actively monitored and computer monitored sessions, respectively. However, she was the least focused student, no matter which management style was being utilized. In contrast, Student B had a similar number of minutes logged to Student C. His focus percentage was 10 points higher than his classmate. Student D, on the other hand, consistently logged the most minutes. His focus time was not greater than any of his classmates.

The study did not find that either style of classroom management made a difference in the percentage of focus time. This is particularly interesting when contrasted with the finding that active monitoring did significantly increase the number of minutes logged by each student. While active monitoring caused students to be engaged with the intervention for a longer time, it did not necessarily increase the quality of the time students spent with their work.

Implications for Students with Disabilities

A deeper understanding of more effective management strategies for iPad-based interventions could have profound implications for students with disabilities. Since special education students are more likely than their general education peers to be assigned to technology-based interventions (Straub & Vasquez, 2015), managing this type of instruction is

particularly important for students with disabilities. As mentioned in Chapter 2, iPad based interventions can be academically beneficial for these students.

Struab and Vasquez's (2015) research focused on the use of self-regulating strategies to encourage students to more independently and efficiently manage their time on 1:1 devices. In this thesis, only one factor was found to be impacted by the different classroom management styles. Actively monitoring the classroom increased the number of minutes logged. Combining a potentially more useful classroom management strategy with research-proven methods such as self-regulation (Straub & Vasquez, 2015) could leverage technology to an incredibly effective role in providing interventions for students with disabilities.

Limitations

This study has several limitations. Using the number of corrections as a measurement of student engagement is highly subjective. Even the most consistent and fair of teachers will vary on what they deem worthy of correction from day to day. While the researcher had established criteria for what behavior would require redirecting, there was still discretion required. Factors such as the number of students requiring correction at a given time, the nature of the behavior, and the teacher's mood can alter which behaviors receive attention. While an analysis was not conducted on the relationship between the number of corrections and student's focus percentage or minutes logged, a preliminary glance at the data suggests this may be misleading. Student D, for example, logged the highest number of minutes, had a respectable focus percentage, and the largest number of corrections.

Another limitation to consider as that two of the measurement instruments, the number of minutes logged and the focus percentage, were drawn from the intervention program. It is difficult to determine how reliable these measurements are. However, the data generated during

practice-sessions prior to the study indicated to the researcher that the instruments were suitably reliable for this project.

To keep contemplative students from logging fewer minutes than they deserved, the *Moby Max* Language intervention was selected for its relatively simple and quick multiple choice questions. The intervention focused on grammar and sentence structure. This however, may have had a different adverse effect. As it was relatively easy for most of the students, this could make it less interesting. Since students were not being drawn into complex problems that required a great deal of attention, this could conceivably have lowered their focus percentage. Twenty minutes is a long time for 6th graders to sit still and be focused on simple questions.

A final limitation to this study is the relatively small sample size. Seven students is substantially smaller than most 6th grade classes in the United States. The findings from this study conducted in a rural, small school environment may not be applicable to larger schools and different demographics.

Future Research

Future research could certainly expand on the rudimentary ideas presented in this study. More reliable technology could be utilized to give researchers more specific information. Programs, such as *Formative*, allow for multiple iPad screens to be viewed on one master computer, which could give a more thorough understanding as to how students are spending their time (www.goformative.com, 2016). A study similar to this one, but with a larger sample size could also be of great use to understanding how students engage with technology and their teachers.

One of the useful aspects of using technology in the classroom can be its ability to increase student collaboration. Another is to use a multimedia approach for students to create

projects to demonstrate their deeper understanding. Unfortunately, this study was not able to examine these aspects of classroom technology use. However, future researchers should certainly investigate these avenues.

If a more similar study was to be conducted, then perhaps a third classroom management option should be explored. Using a tablet or smartphone, a teacher could use the computer data while actively monitoring her classroom. The benefit of both strategies as the same time could prove highly useful for classroom management. This study looked only at student engagement, and not student achievement. It would certainly be interesting to add a component examining if either style of classroom management had a measurable effect on student achievement.

Conclusions

Of the three types of measurement taken for this project, number of corrections, number of minutes logged, and the percentage of time spent focused on work, only one of them suggested a significant correlation to one of the classroom management strategies: the number of minutes logged was improved by a teacher actively monitoring and patrolling the classroom. The lack of statistical evidence does not mean that classroom management does not affect how students spend their time, it simply means that there was not evidence for it here.

The finding that there is a significant bump in actual time spent on the intervention when a teacher is physically present is interesting and useful. As schools migrate towards relying more and more on technology in our classrooms, there is still an important and meaningful place for real teachers, in classrooms, with students.

References

Aubusson, P., Burke, P., Chuck, S., Kennedy, M., & Frischknecht, B. (2014). Teachers choosing rich tasks: The moderating impact of technology on student learning, enjoyment, and preparations. *Educational Researcher*, 43(5), 219-229.

Bui, Y.N. (2014). *How to write a master's thesis*. Los Angeles: Sage.

Ciampa, K. (2013). Learning in a mobile age: an investigation of student motivation. *Journal of Computer Assisted Learning, 30*(1), 82-96.

Cook, J., & Oliver, M. (2002). Designing a toolkit to support dialogue in learning. *Computers & Education, 38*(1-3), 151-164.

Falloon, G. (2015). What's the difference? Learning collaboratively using iPads in conventional classrooms. *Computers & Education, 84*, 62-77.

Flower, A. (2014). The effect of iPad use during independent practice for students with challenging behavior. *Journal of Behavioral Education, 23*(4), 435-448.

Gray, J A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online environments. *International Journal of Educational Leadership Preparation, 11*(1), 1-20.

Klem, A. M., & Connell, J. P. (2004). Relationships matter: Linking teacher support to student engagement and achievement. *Journal of School Health*, 74(7), 262-273.

Lawson, M. A., & Masyn, K. E. (2015). Analyzing profiles, predictors, and consequences of student engagement dispositions. *Journal of School Psychology, 53*(1), 63-86.

Lewis, A. D., Huebner, E. S., Malone, P. S., & Valois, R. F. (2010). Life satisfaction and student engagement in adolescents. *Journal of Youth and Adolescence, 40*(3), 249-262.

Marks, H.M., (2000). Student engagement in instructional activity: patterns in the elementary,

middle, and high school years. *American Education Research Journal.* 37(1); 153-184.

Mills, K. A., & Exley, B. (2014). Time, space, and text in the elementary school digital Writing Classroom. *Written Communication, 31*(4), 434-469.

O'Toole, J. M., & Absalom, D. J. (2003). The impact of blended learning on student outcomes: is there room on the horse for two? *Journal of Educational Media*, *28*(2-3), 179-190.

Rauh, J. (2011). Online education as a toll good: An examination of the South Carolina virtual school program. *Computers & Education, 57*(2), 1583-1594.

Rock, M. L., Schoenfeld, N., Zigmond, N., Gable, R. A., Gregg, M., Ploessi, D. M., & Salter, A. (2013). Can you Skype me now? Developing teachers' classroom management practices through virtual coaching. *Beyond Behavior*.

Selwyn, N., & Facer, K. (2014). The sociology of education and digital technology: past, present and future. *Oxford Review of Education*, 40(4), 482-496.

Sessions, L., Kang, M. O., & Womack, S. (2016). The neglected "R": improving writing instruction through iPad apps. *TechTrends, 60*(3), 218-225.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85*, 571-581.

Smith, T. (2014). Elementary science instruction: examining a virtual environment for evidence of learning, engagement, and 21st century competencies. *Education Sciences, 4*(1), 122-138.

Straub, C., & Vasquez, E. (2015). Effects of synchronous online writing instruction for students with learning disabilities. *Journal of Special Education Technology, 30*(4), 213-222.

Thomas, M., & Hofmeister, D. (2002). Assessing the effectiveness of technology integration: message boards for strengthening literacy. *Computers & Education, 38*(1-3), 233-240.

Zheng, B., & Warschauer, M. (2015). Participation, interaction, and academic achievement in an online discussion environment. *Computers & Education*, 84, 78-89.