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Does the Use of Electronic Texts in Small Group Reading Instruction Impact Comprehension?

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Does the use of electronic texts in small group reading instruction impact student comprehension?

Volume 1 of 1

Monica Pike Marino

A thesis submitted for the degree of Doctor of Education

University of Bath

Department of Education

April 2019

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MONICA PIKE MARINO

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Early in this journey, I compared earning an EdD at Bath to walking up Bathwick Hill from the centre of Bath. It felt daunting and endless when I began, and for a long stretch in the middle I couldn't see the beginning nor the end. And then suddenly, nearly before I realised it was over, I was strolling along a flat road, looking at the University of Bath sign. I wasn't totally finished yet- half a mile to go, typos to fix, charts to polish up, final payments to make. But there in that easy stretch of flat road, I felt a sense of triumph, and slowed down to savour the rest of the journey to the beautiful campus in Claverton Down.

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And now, on to the next adventure. To borrow the words of Anne Shirley, "Oh, it's delightful to have ambitions. I'm so glad I have such a lot. And there never seems to be any end to them- that's the best of it. Just as soon as you attain one ambition you see another one glittering up still. It does make life so interesting."

ABSTRACT

Due to the increased presence of e-books in primary schools, practitioners are wondering if e-text is ‘better’ for student reading comprehension than paper text. This dissertation, a small-scale, mixed-methods study, set out to examine differences in primary school student reading performance when using e-books versus paper books. The research is grounded in constructivist beliefs that learning is a co-created construct, shared between students and teachers. A review of the literature explores the concepts of e-book, reading comprehension, and how reading comprehension is measured, along with Puentadura’s 2006 SAMR model as a framework upon which to explore the impacts of educational technology.

The study employs the Fountas and Pinnell Benchmark System to measure students’ reading levels before and after the data collection period. During the data collection period, the teacher taught small-group reading lessons, and half of the participants used e-books while the other half read paper copies of the same text. The study employs discourse analysis and thematic analysis to examine the impact of the text type on student comprehension.

The findings suggest that more work is needed to determine the impact of e-text on student comprehension. However, in this exploratory study, the performance of students in the two groups appeared to be similar. The study found that the text-to-speech feature available on Kindle devices and its impact on reading comprehension require further examination. The findings suggested that Kindle might be considered a separate genre requiring its own explicit instruction, and more work will need to be done in order to bring teacher professional development in line with this suggestion.

Chapter 1

Introduction

This thesis presents a study examining the impact of text type on reading comprehension during small group instruction with primary school students in Massachusetts, USA. The aims and objectives of this study were to determine what, if any, impact there was when students received small-group reading instruction using e-books compared to paper books. The e-books chosen for this study were Kindle Fire¹ devices. The project was a small-scale, exploratory study, comprising thirty students ranging in age from 9—11—years old, and conducted at a public primary school in Massachusetts, USA. The design of this study was intended to mirror typical classroom instruction as much as possible. After giving assent and consent to participate, and after an initial period of excitement over using an e-book, most students and parents did not notice any difference in the delivery of instruction. Once the period of data collection was finished, the students transitioned seamlessly back to typical instruction with me as their reading teacher. The data collected during this pilot study, presented in this thesis, suggests that while there is more research needed in the area of the impact of e-books on reading comprehension, there is no significant difference in reading comprehension based on text type.

1.1 Context for the study

As an avid reader, when the Kindle initially appeared on the scene, I was resistant to its charms. I knew I would mourn the act of opening a book and smell the paper and ink. Lending books is an everyday activity among my family members, and a massive piece of family culture. My husband has always been shocked that in December, I race through all the books I have purchased for my relatives, so when they open their Christmas gifts, I can tell them “I read that last week. It’s fantastic.” How could I lend a book on a Kindle? How could I re-gift a beloved novel? I worried about the effects of the backlight, since after a long day of working on the computer, my eyes are tired and I relish being able to escape into a paper book. However, after receiving a Kindle as a gift, I started to see some value. I quickly became accustomed to its quirks (having to click a button with my right hand to page forward was more difficult to do with a mug of tea *also* in my right hand). I began to appreciate the benefits of having a book with me at all

¹ Amazon, Kindle, and Kindle Fire and all related logos are trademarks of Amazon.com or its affiliates. (Kindle Brand Use: Marketing Guidelines, 2018).

times. I valued the ability to take as many books as I could afford with me on holiday- I could now avoid heavy baggage overage fees! I found that choosing an e-book without a backlight allowed me to feel like I was reading a paper text. I adapted, and at this point, I will read books in either format, and I don't have a preference when it comes to pleasure reading.

I never stopped to consider the fact that I had learnt to read on paper books and was transferring that skill to a new task until I started to see increased instruction taking place in primary schools using ebooks. At that point, I was comfortable reading both formats, and as an experienced and competent reader, I had no trouble transitioning back and forth between the two. However, I started to wonder about the impact this type of text was having on students who were less adept at reading. I started thinking about my own experiences. As a doctoral student, I never chose to read anything academic in digital form. In fact, in all academic reading, I need to print it out and read it with pen in hand so I can take notes. If a textbook is not available in paper format, I am hesitant to use it. While I have the skills to do so, I don't feel as comfortable navigating e-text when the stakes are high. I am very fortunate to live in a part of the world where most academic texts are available to me through interlibrary loans, and where I have the financial and technological resources to print online journal articles. If I were undertaking this EdD in an area of the world where English language paper textbooks were not easily available, I would have had to adapt my reading skills and preferences. I imagine I would have been able to do so, as I am a competent and experienced reader. But what about my students? Reading is already challenging for them. They have had at most five years to master reading paper books; I have had much, much more than that. They are exposed to paper books at school, but at home, due to both family circumstances and the practical experiences of life in 2018, they have less exposure to print and far more exposure to technology than I did (or indeed, do!). I wondered if the fact that I prefer to read more challenging text in paper format is because it is inherently easier to comprehend paper text or if it is because I am more comfortable with paper text, as my entire academic career until very recently was conducted in paper. Was it possible that my students would find reading on a Kindle easier because of their increased exposure and familiarity with technology?

When I set out to begin this research project, I chose to focus on reading comprehension because, as a reading specialist working in a primary school, I notice comprehension as an area of struggle for many students. Policymakers, school leaders, and teachers are asking students to display higher order thinking skills on a daily basis, and in order to do this, students must be able to comprehend the texts they are reading. I

am always seeking deeper understanding of the reasons students experience difficulty. Wearing the dual hats of practitioner and researcher, I wanted to delve more deeply into the area of reading comprehension, but I wanted to engage in timely research that might impact teaching practice. I also wondered if digital text or paper text was *better*. I hoped I would find a very clear answer, and be able to share that with school leaders, so that we could forge ahead in curriculum development using what is best for students.

Prior to beginning this small-scale study, I was able to anecdotally list differences I had seen in students when they read e-books and when they read paper books, but I needed to examine the trends in a more systematic fashion in order to draw legitimate conclusions. Also, I was starting to see school funding shifting away from purchasing books for children and towards purchasing technology. I wondered about the impact of these decisions, which seemed based in the desire to add the latest technology to classrooms so that school leaders could parade the devices in front of parents to impress them, without much regard to the pedagogical impact on students. The increased state and school pressure on me as a teacher to lift students' reading comprehension levels while infusing technology into my practices led to me wonder about the impact of the type of text on student comprehension. The question driving my research project was "Does the use of electronic texts in small group reading instruction with students ages 9–11–years-old impact student reading comprehension?"

1.2 Review of the Literature

In Chapter 2, I set out to examine the current literature surrounding e-books and classroom instruction. To date, there is no definitive answer regarding which text type is more effective for student learning. Some researchers concluded that the impact using an e-book on student comprehension and reading performance was positive (Tay, 2016; Maine and Shields, 2015; and Gray and Howard, 2017). Other researchers concluded that the impact of electronic text on students was negative (Singer and Alexander, 2017 and Hau et al, 2017). This lack of a clear answer indicates a gap in the research where more research is necessary (Mangen and van der Weel, 2016; Cho and Afferbach, 2017; Rose, 2011 and Jamshidifarsani et al, 2018). More investigation is needed to determine the impact of text type on student reading comprehension. In addition, much of the research to date has been conducted with university level students or very young children. There seemed to be a lack of study on the impact of text type on primary school students in typical primary classroom settings or during small group instruction. As such, I felt that creating a small-scale study to examine the impact of text type, my research would potentially fill small gap in the literature.

1.3 Research Design

In Chapter 3 and Chapter 4, I lay out my research method and methodology. In crafting my research design, I kept the practicalities and limits of my daily schedule in mind. I created a mixed-methods, small-scale study where I used our school's mandated reading assessment as the quantitative measurement, and then during instruction, I used qualitative research methods and collected data in the form of field notes, interviews, and video recordings. I focused heavily on discourse analysis and thematic analysis to analyse my data. This type of data collection and analysis lent itself neatly to my practical work as a teacher, as well as to my personal style of note-taking and reflection during my small-group reading lessons. I used Puentadura's 2006 SAMR model as a framework for evaluating some of the tasks I was asking students to do.

The research was conducted over a period of twelve weeks, and involved thirty students at the outset. Two students moved during the course of the enquiry. It is important to note that the research did not negatively impact the students' academic experiences, as I was able to provide it under the umbrella of reading instruction I would have provided them if I were not conducting research. Standard ethical and confidentiality procedures were followed, as described in section 4.9.

1.3.a Where was the research conducted, and who participated?

This research was conducted at the public, coeducational, primary school in northeastern Massachusetts, where I am currently employed as a reading specialist. The school adheres to all state and local curricular requirements, and is one of nine primary schools in the city. In September, January, and April of each year, the reading staff administer a reading assessment to all students. We form reading groups based on the results of the assessment. I used the data from the initial assessment to form the six reading groups whom I would service. The students who participated in this enquiry were all fourth graders, which means they were between the ages of nine and eleven. None of the children I selected had a diagnosed reading disability. The reading instruction model in this school requires that students receive small group guided reading each day from either their class teacher or a reading specialist. Each time our staff assess students, we sit as a team to form groups. The groups are, by nature, fluid and flexible. Students often read with two or three different adults in a variety of small groups over the course of the

school year. This flexible grouping model allowed my research to fit very naturally into the daily schedule and expectations of the school.

1.4 Data Collection and Analysis

In Chapter 5, I lay out the types of data I used during the enquiry, and describe in detail how I went about collecting and analysing that data. The aim of this section is for the reader to understand how the mixed-methods, action research style of the project lent itself to the collection of a variety of quantitative and qualitative data. Figure 5 depicts the type and amount of data amassed during the study.

1.5 Findings and Recommendations

In Chapters 6 and 7, I analyse the data and present my results. My findings from this enquiry were in keeping with the current research. It appears that there is no clear better type of text for primary school students. In fact, the overall progress of the students in both the paper group and the Kindle group was very similar. However, I suggested that there are some factors that might need closer examination. In future research, we might want to examine the impact of listening to text-to-speech, and its transferability to paper assessments. I found that there are some Kindle-specific skills that students will need to have in place in order to be successful with reading e-text, and future research will also be needed in the area of teacher pedagogy and prompting when using e-books, if teachers plan to use them in primary school classrooms. I also found that a modification to Puentadura's 2006 SAMR model might be beneficial, and offered a suggestion for an alternative design of that model.

1.6 Conclusions

In Chapter 7, I present the conclusions I have reached. Over the course of this enquiry, and indeed, over the years of study on the EdD course, I have been asked countless times if Kindle is better than paper book. People have offered me their own anecdotal opinions with examples. Colleagues, friends, parents of my children's friends, and former students all seemed to have very strong opinions when it comes to digital *versus* paper reading. They want me to give them a definite answer; *is* Kindle better than paper? At the outset of the research, I thought perhaps I would be able to offer a clear answer. It seems, however, there is not yet a straightforward answer. There are some supports that e-books offer that benefit some students, especially when teachers are able to teach the specific skills students need in order to access those tools. It is possible that the support that text-to-speech provides has the potential to be very beneficial, especially for students who are not native speakers of English. However, my data suggested that

there is still the consideration of student preference to keep in mind. Some students found the backlight on the Kindle book was painful for their eyes, and some students found the e-book distracting. It seems clear from this research that more work must be done to help teachers align their teaching practices with the demands of e-books in order to fully harness the advantages that e-books can offer. As is often true when dealing with action research, in a school setting, there is no absolute answer. The best explanation I can offer when asked if Kindle books are better for students than paper books is as follows. At some points, for some students, with explicit instruction, e-books have the power to effect transformative change on student comprehension. However, as with any tool, without specific, targeted instruction, in the hands of an inexperienced user, the e-book can become a novelty item. At best, the e-book has the power to become a transformative tool for a certain type of learner, when coupled with clear instruction. At worst, it seems the type of text has little impact on student comprehension. More research will be needed to examine these trends more deeply, especially as technology evolves. While this is not always a satisfactory answer at a cocktail party, I find that it is in keeping with the current research and my experience as a practitioner.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

At the outset, it is important to define key terms as they will be used in this enquiry. As the data for this study will be collected in small group reading groups during what is known as guided reading, I wish to begin by providing the reader with an overview of what guided reading looks like in a typical classroom setting. Students are evaluated based on their reading skills, and I would like to offer the reader an overview of how reading is measured in the setting where the data will be collected. I will then review recent literature surrounding classroom discourse, and the research that suggests it is a key factor in reading comprehension. Next, I intend to examine the current research regarding e-readers and comprehension. The goal here is not to examine the physical impacts of reading on an e-reader, like eye strain or neurological processes, but more to compare and contrast the research regarding student *comprehension* on e-readers. I will briefly discuss the idea of redefining reading to include more modern constructs like e-readers. I will give attention to Puentadura's 2006 SAMR model, a framework helpful for thinking about how technology is used in instruction, where technology usage is identified as substitution, augmentation, modification, or redefinition. Finally, the reader will be asked to consider some other research that may pertain to this enquiry, including student motivation and parental engagement.

At present, it appears that the research regarding reading comprehension on e-readers does not give us a clear picture of their impact on student reading comprehension. What does seem clear from the current research is that teachers will need to closely examine their teaching practices when using educational technology and e-books in order to maximise student outcomes. In this vein, this research enquiry is designed to study the impact of the use of Kindle Fire devices on student reading comprehension in primary school students, with a focus on examining classroom discourse as a major measure of student comprehension. The study is grounded in the beliefs that learning is constructed through conversations among teachers and classmates, and reading comprehension is generally achieved through direct instruction and conversation. Therefore, the literature presented in this section will examine reading comprehension through a constructivist lens. In this section, I will argue that reading instruction comprises several key components, each of which are integral for students to be able to demonstrate

competency in reading. First, I will examine these components in isolation against the current literature. Then, taking reading comprehension as a unit, I will examine the larger picture of reading comprehension as it is impacted by digital technology.

In examining the current literature surrounding reading comprehension, I must first present a working definition of reading and reading comprehension, and examine a variety of methods that are used to measure these academic skills. In the upcoming sections, I will do so. I will also review the important terms related to this study and its context.

2.2 What key terms and concepts are important to this study?

In this section, I will examine the meaning of terms that are used frequently in the context of the study.

2.2.a Reading comprehension

Several researchers have reached a consensus that reading comprehension is an interactive process by which readers rapidly use active processes in order to gain meaning from written text researchers (Snow, 2002; Gavelek and Wittingham, 2017; Goodman, Goodman and Allen, 2017). These researchers also agree that reading is part of a larger socio-cultural process, impacted by prior knowledge, type of text, motivation, and capability. During this enquiry, I intend to examine all of these factors.

For the purposes of this enquiry, this general definition of reading comprehension is a good starting point, but it must also be acknowledged that the current definition specifies that these active processes take place whilst interacting with *written* text. In the case of the students who will read on Kindle Fire devices during my enquiry, they will be offered the opportunity to listen whilst reading using the text-to-speech feature. If we apply Puentadura's (2006) SAMR model to this definition, the students would be modifying their task by adding in a layer of listening comprehension. It may be challenging to determine if the students are gaining their meaning from the written language, the spoken language, or a combination of both. During the enquiry, the use of text-to-speech for short segments will be noted and taken into account. A slightly more

accurate working definition of reading comprehension for the purposes of this enquiry might be:

an interactive process by which readers rapidly use active processes in order to gain meaning from written text, *potentially supported by auditory or graphic enhancements.*

Chang and Millett (2015) found that audio-assisted reading had a positive impact on both reading comprehension and reading rate. They contend that fluent readers exhibit more automaticity, and therefore are more able to devote their cognitive energy to synthesizing, predicting, and questioning- the skills required in order to fully comprehend the text. By offering students the support of audio, Chang and Millett suggest that students were more able to use active processing strategies and increase their comprehension of the text. In their study, comprising secondary school students, the students were assigned to a silent reading group or an audio-assisted reading group. It might be argued that this predetermined assignment removes the element of choice from the student. I contend that many students know their learning styles well enough to choose the supports they know will best help them, and that some students will choose no supports at all. For the purposes of my enquiry, the students who were reading on Kindle Fire devices were allowed to choose to use the supports at their own discretion.

On the other hand, Rogowsky, Calhoun, and Tallal (2016) found no significant difference when college-educated, native English-speaking adults read an e-book only, read it whilst listening to the audiobook, or listened to the audio version only. These researchers acknowledge that the narrow population of their study might have impacted their findings, and suggest more research is needed to examine the differences that students who are learning English, younger students, or the elderly might exhibit. It should also be noted that these researchers did not include a print-only group, so it we cannot use this study to draw conclusions about the differences in comprehension between print and digital media.

A critic might wonder if offering the use of a text-to-speech tool during guided reading ‘counts’ as reading. I contend that in this research setting, it is an acceptable modification of the task at hand, which is to read for meaning. In section 2.7 and Figure 2, I give attention to Puentadrua’s 2006 model, which is a lens through which we can evaluate modification of reading by adding technology. It is important to consider that in this research setting, for students in the upper primary grades, a large part of reading instruction is student construction of meaning from text. I have chosen to focus on this specific skill during this small-scale enquiry. These are not early primary students who are attempting to learn to decode phonemes. Secondly, the piece of guided reading where

they might choose to use this tool is just a small part of the students' overall daily instruction. There will be many other tasks each day that require students to read without the modification of hearing the text read aloud. During the guided reading lesson, students will still be asked to read aloud to the teacher as she checks on them, so they must maintain focus on the written language as well. Finally, as a practical consideration: these students will be leaving primary school in a few short months, and for the rest of their academic lives, they will be asked to construct meaning from text independently, and are unlikely to be asked to read aloud to a teacher. It would be naïve to think that they will not avail themselves of every possible tool to boost their comprehension. As such, it behooves researchers and teachers to examine more closely the tools available to students, and how teachers can harness these tools to promote more understanding of text.

2.2.b E-book

Vassilou and Rowley define an e-book as a digital device that "...integrat[es] the familiar concept of a book... [and] typically [has] in-use features [such as]...annotations, highlights, multimedia objects, and interactive tools." (2008, p. 363). These interactive features can include text-to-speech, dictionaries, or even animation. For the purposes of this research, I will use Vassilou and Rowley's definition of an e-book. In writing about my research, I use the term e-book to mean Kindle Fire device, the brand I chose in this study. In writing about the research of others, or e-books in general, it can be assumed that e-books falling under Vassilou's and Rowley's classification can include iPad² devices, applications for the iPhone, or other brands of electronic books.

2.2.c Technical capital

Although the focus of this study is reading comprehension, technology in the form of e-books is one of the two vehicles for delivering instruction being considered during this pilot study. It is important to address some current theories regarding technology and the role these theories play in instruction as they pertain to this enquiry. Grounded in Bourdieu's definition of cultural capital (Bourdieu and Nice, 2017), researchers (Yardi, 2010; Hayhoe et al., 2015) suggest that there is a newer form of

² iPad and iPhone are trademarks of Apple, Inc., registered in the U.S. and other countries (Legal-Trademark List-Apple, 2018).

capital that today's students require- technical capital. Yardi (2010, p.1) defines technical capital as "...the availability of technical resources in a network, and the mobilization of these resources in ways that can positively impact access to information and upward mobility." Yardi suggests that a working theory of technical capital might help us to understand and define the way that people develop and retain technical skills, and she suggest that this theory might lend itself to the design of intervention to help those who might have less technological capital. For the purpose of this enquiry, I am most concerned with the suggestion that technical capital can help students access information; namely, from the e-book during reading instruction.

2.2.d Reading level

The term 'reading level' will be used when referring to student progress during this inquiry. In this section, I will examine what reading level means in the context of this inquiry. A reading level "... stands for a set of behaviors and understandings that ... are observable in readers who process a text well." (Fountas and Pinnell, 2012, p. 276). Fountas and Pinnell have developed Progress Monitoring by Instructional Text Reading Level chart [Appendix D], based on *The Continuum of Literacy Learning Grades PreK8: A Guide to Teaching* (Pinnell and Fountas, 2011) which serve as a general framework from which teachers and school leaders can base their curricular objectives. (F & P Text Level Gradient, 2012; Progress Monitoring by Instructional Text Reading Level, 2012). A text gradient, or continuum, is "... a basis for analysing texts and organizing them for instruction." (Fountas and Pinnell, 2017, p. 295). Many factors, including text structure, sentence complexity, vocabulary, and print features, are incorporated when a book is levelled for teacher use. Readers meet increasing challenges as they encounter texts at each new level. Background knowledge, interest level, and a supportive teacher introduction all impact how the students will react to these instructional challenges, and how they will tackle the text (Fountas and Pinnell, 2012, p. 278-280 and Fountas and Pinnell, 2017, p. 298-305).

Fountas and Pinnell are not alone in their attempt to create a linear set of reading skills. In 1944, Frederick Davis established a set of nine categories of reading skills, including identifying the main idea of the text, making conclusions about the passage, and comparing and contrasting. This skill set served as a pathway of sorts which led to successful reading (Pearson and Cervetti, 2017). Cho and Afflerbach state that reading comprehension skills "...are developmental in nature, learned...[and] practiced by increasingly accomplished readers until fluency of strategy use is achieved." (2017, p.

111). Again, we see this idea of comprehension skills as a ladder which students are expected to climb in order to become proficient readers. Teachers use these resources to understand the demands their students and offer the students instruction at an accessible level.

From this research, we can see that a framework of skills by which teachers and researchers can measure student progress in reading comprehension is a helpful instructional tool. While there exist a variety of such models, it is typical for these models to serve as a sort of rubric by which teachers can determine a reading level for each child. The goal is typically for children to progress along the levels, demonstrating gains in reading skill. For the purposes of this enquiry, I will use such a model in order to quantitatively measure growth in reading comprehension. In the next section, we will examine the instructional practices that many teachers use to achieve this aim.

2.2.e Guided reading

Given the assumption that the goal of reading instruction is to foster continued student growth along reading comprehension levels, we must consider the instructional approaches teachers use to accomplish this task. Many literacy programmes use small group guided reading instruction as a way to offer differentiated instruction for all students. Much of the data for this enquiry will be collected during guided reading lessons. In order to place the data into context, we must first examine guided reading as one component of balanced literacy instruction in primary classrooms.

Fountas and Pinnell define guided reading as “...small-group instruction that builds each student’s ability to process increasingly challenging texts with fluency and understanding.” (2006, p. 11). They suggest that teachers have adopted guided reading as a method by which to provide instruction to a “...broad range of learners in their classrooms.” (Fountas and Pinnell, 2012, p. 269). Creating small groups of learners within the larger group allows teachers to bring together students of similar reading abilities to focus on the same, deliberately chosen, text. Teachers provide these students with the opportunity to engage with text that is an appropriate reading level, so that the students can expand their system of making strategic actions during processing (Fountas and Pinnell, 1996 p. 2-6 and Fountas and Pinnell, 2006 p. 373-374). Guided reading provides teachers the opportunity to differentiate within their classrooms. Dewey (2009) suggested that individual attention is guaranteed when teachers use small group instruction in order to best meet individual student needs. Dewey called for teachers to be aware of each child’s strengths and weaknesses, and to use a series of “...dictated

directions...” (2009, p. 74) in order to allow students to synthesize and solidify their thinking. Fountas and Pinnell contend that guided reading will allow teachers to practice “... responsive teaching- teaching that is grounded in the teacher’s detailed knowledge of and respect for each student...” (2017, p. 10). Such deliberate and reflective teaching allows teachers to meet individual student needs by capitalizing on each child’s individual strengths and responding to each child’s weaknesses, just as Dewey suggested. Lipp and Helfrich (2016) suggest that expert, intentional teaching during a guided reading lesson can, in just the fifteen to twenty minutes allotted for each group, dramatically accelerate student progress. They also remind teachers that guided reading is an opportunity for teachers to collect observational data on each child, offering insight into the ways students demonstrate both successful and unsuccessful problem solving whilst reading.

Guided reading has garnered merit as a powerful instructional strategy for readers of all types. Montero, Newmaster and Ledger found that guided reading can “...address nonliterate [sic] and semiliterate adolescent refugee students’ print literacy gaps.... allowing them the time and space to realize that they are in charge of their literacies” (2014, p. 67-68). Barnes suggests that offering students space to practice their skills in a small group setting is less risky, and provides students the opportunity to make small mistakes and explore language in a safe way, before taking the leap to sharing with a whole classroom (as cited in Skidmore, 2016). Wharton-McDonald and Erickson (2017) identify that the demands of reading comprehension increase greatly in the intermediate grades, as students transition from ‘learning to read’ to ‘reading to learn,’ where they must extract meaning from increasingly complex text with unfamiliar concepts and language structures. Wharton-McDonald and Erickson suggest that the decline in reading test scores that researchers see around fourth grade can be attributed to demands of more advanced strategies, or perhaps their increased amount of time spent with technology in comparison to printed text. Wharton-McDonald and Erickson agree that expert, focused teaching where the teacher models explicit strategies for students and then provide them with time in a small group to practice the strategies on accessible text will help students increase their comprehension skills (2017, p. 356-7).

The basic structure of an approximately twenty-minute guided reading lesson incorporates at least five or six components. The aim of a guided reading lesson is always to teach the skills the child requires, not the text; teachers focus on encouraging strategic action whilst reading rather than viewing the text as something to ‘get through.’ The core elements of a guided reading lesson, adapted from Fountas and Pinnell (Fountas and

Pinnell 1996 p. 7-10, Fountas and Pinnell, 2006 p. 373-382 and Fountas and Pinnell, 2017, p. 12-22) are as follows:

1. *Introducing the text*—The teacher selects a text that s/he feels will best offer the students an opportunity to engage with appropriately challenging text. This task is of utmost importance, as it sets the child up for learning- or lack thereof. Educational philosopher John Dewey states that it is the responsibility of the educator “...to arrange for the kind of experiences which... engage his activities...[and] promote having desirable future experiences.” (2015, p. 27). It is the responsibility of the teacher to choose texts that encourage students to make generative actions whilst reading- each action the child takes should be something he can use in future attempts at more challenging work. Keeping Dewey’s suggestions in mind, the teacher also might want to choose interesting books that will prompt students to want to read more. The book introduction serves as a sort of stepping stool for the child to gain access to text just beyond his/her reach. Dewey, a strong proponent of using prior knowledge to fuel future learning, states that students need opportunities to discuss prior experiences with peers and teachers, and make new observations in order to extend their thinking. (2009, p. 82-84). A book introduction should offer the child an opportunity for some discussion with classmates and activate his/her prior knowledge at the same time. At the beginning of each lesson, the teacher will offer students a general overview of a short segment of text, providing key bits of information that will make the text accessible to the students, including calling attention to potentially unknown vocabulary, difficult language structures, or new concepts. This component of the lesson is grounded in Vygotskian theory, allowing children to work within their zone of proximal development. Vygotsky defines the zone of proximal development as “...distance between the actual developmental level...and the level of potential development... under adult guidance or in collaboration with a more capable peer.” (1978 p. 86). An intentional and focused conversation among teacher and students will help readers use what they know in order to successfully process new information. Goodman, Goodman, and Allen (2017) state that comprehension is always based upon two factors “...what the reader knew before the

reading and what the reader is comprehending during the reading.” (2017 p. 84).

2. *Reading the text*—The students will read the text independently. Younger and less advanced readers will read in a whisper, older or more advanced readers read the text silently. Students read at their own pace, focusing on their own text. This is not ‘round robin’ reading or choral reading. While the students are reading to themselves, the teacher will unobtrusively check in with each child to evaluate accuracy, fluency, and monitor for evidence of strategic action. Teachers make notes on individual student reading during this time and collect evidence of processing and strategic actions.

3. *Discussing and revisiting the text*—The teacher and the students engage in a short but meaningful discussion about the text. The aim of this piece of the lesson is to build understanding and allow students opportunities to ask questions about what they have read. During this piece of the lesson, the teacher will encourage readers to make inferences and connections, model a close examination of the text to find information or the author’s message, and show students how to critically evaluate the writing. Fountas and Pinnell state that “Interaction between the teacher and students extends understanding of a text.” (2006 p. 11). This lesson segment is grounded in both Dewey’s and Vygotsky’s theoretical approaches. Vygotsky states that it is an “...indisputable” fact that “...thought development is determined by language...” (1986 p. 94). Dewey’s perspective, that teachers should draw upon past experiences of students in order to promote interaction and experience. When the student experiences something new, he uses what he has learnt as a foundation for new knowledge (2015, p. 41-15). During this segment of guided reading, teachers capitalise on the time they have to interact with this small group of students to use the power of language in order to build understanding and deepen comprehension. During this segment of the lesson, the teacher

will again be seeking examples of student processing and understanding, and be noting such evidence.

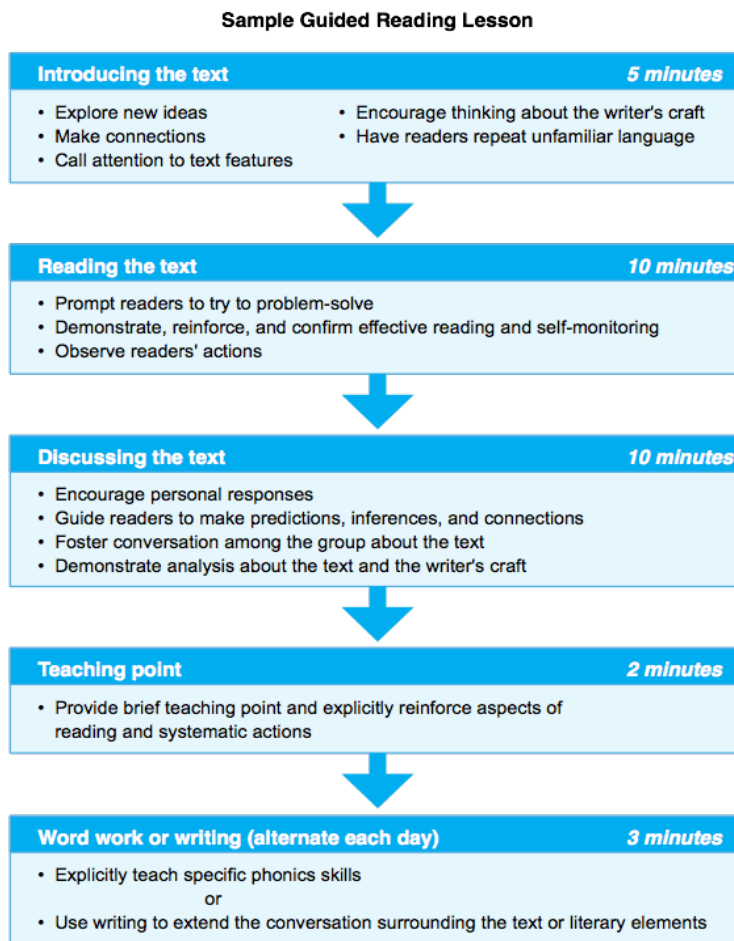
4. *Teaching for processing strategies*—At this point in the lesson, the teacher will select a “...brief, explicit teaching point...” (Fountas and Pinnell, 2006 p. 376). Teachers will select this teaching point based on the reading that students have just completed. The aim here is not to teach the content in the book, but rather to focus on one small element of the act of reading, and to consider it a building block for future knowledge. The teacher must evaluate student needs here, and select a valuable teaching point. S/he will also evaluate student responses to teaching here, in order to think about future teaching points or to note student progress or mastery. Dewey’s theoretical approach is evident in this section of the lesson as well. Dewey states that the teacher should be “...intelligently aware of the capacities, needs, and ... experiences [of students] ...” (2015, p. 71). He points out that this process is reciprocal, and will involve discussion, interaction, and input from both the teacher and the student in order to become a “...co-operative enterprise...” (2015, p. 72). At times, the teaching point will naturally evolve from the discussion of the reading, and on other days the teacher will need to close the group conversation and move on to an explicit teaching point.

3. *Working with words*—This component of the lesson is short but powerful, especially for less advanced readers in order to build their phonemic awareness. Teachers focus on word solving (for example, using prefixes or forming plurals) that is not necessarily related to the text the students have read. Students might use magnetic letters or a whiteboard to manipulate words and build awareness of features of letters and words.
4. *Extending the understanding of the text*—This piece of the lesson is optional, and teachers can make decisions based on the individual needs of their students. This is where teachers will use writing or drawing in order to extend the students’ understanding of the text, or as a foundation

for further talk about texts. At times, teachers will use this time to assign homework or independent practice.

See Figure 1 to further understand the structure of a typical guided reading lesson. During this research project, I used this framework as a guideline for my lesson planning, as it is identical to the format the classroom teachers use for reading instruction, and also the same format I used for teaching small groups before and after the pilot study. During the data collection phase, I used this format as a framework for the lesson plan for each group.

FIGURE 1: Diagram illustrating a sample guided reading lesson as it was used during this action research pilot study.



Based on Fountas and Pinnell (2006, p. 375–376)

From this section, we can see that researchers agree that small group, focused instruction tends to allow students optimal opportunity to succeed in reading, as well as offering the teacher a solid opportunity to closely examine student reading behaviours. It

is in such a setting that the research will be conducted, so it is important for the reader to see the basic outline of a guided reading lesson, as it is integral to the context of the study. The structure of a guided reading lesson allows children several opportunities to practise both decoding and discussing, and offers teachers a place where they can scaffold student discussion in order to create a richer dialogue surrounding the text. From this section, we see a clear lesson plan for guided reading lessons as they were conducted during the enquiry, with a view to improving student reading comprehension. The next section will offer an overview of the way reading comprehension can be evaluated and measured.

2.3 How can reading comprehension be measured?

The objective of guided reading lessons is to improve reading skills for students. In order to determine the effectiveness of these lessons, comprehension should be measured in some fashion. While reading comprehension remains a challenging skill to measure, researchers and educators have made attempts to do so. This section will examine trends in measuring reading comprehension, paying particular attention to the measure used for the purposes of this enquiry.

Leslie and Caldwell (2017) classify assessments of reading comprehension into two categories: *formal* measures of assessment and *informal* measures of assessment. Formal assessments include large-scale assessments such as the PARCC [Partnership for Assessment of Readiness for College and Careers (Anon 2018) test, which uses a selected-response model like multiple choice. These assessments are grounded in the assumption that if the student can correctly answer the question, s/he must have understood the text to some level. Another type of formal reading assessment is the constructed response, which requires students to summarise, compare, contrast, or infer. These assessments are considered a better indicator of inferential comprehension, while presenting the challenge of subjective scoring. Advances have been made in machine-scoring these constructed response tests, which might increase validity and likely increases the volume of use of this type of assessment (2017). The Neal Analysis of Reading Ability, the Macmillian individual reading analysis, and the Weschler objective reading dimensions are further examples of tests of reading comprehension that use open-ended questions. Cain and Oakhill comment that the verbal response component to these assessments can be a hindrance to students who have difficulties with verbal expression, however, the inherent advantage is that this type of response can highlight students with

weaknesses quickly, in order to provide them with the correct interventions (Cain and Oakhill, 2006).

Informal reading assessments are generally based on some type of questioning of the reader, likely asking the reader to answer both literal and inferential comprehension questions. One such informal reading assessment is the IRI (Informal Reading Inventory), which provides the teacher with diagnostic information about what level of text the child can decode and still retell accurately. Another widely used assessment tool, and the tool to be used as one measure of comprehension in this enquiry, is the Benchmark Assessment System³, developed by Fountas and Pinnell to inform instruction. They describe the BAS as “...a standard against which to measure something. A student reads a series of texts that represent the challenges at each level and then talks about each. The students’ reading is matched against the benchmark level to find the highest level the student can read with satisfactory comprehension. This comprehensive assessment system is linked directly to classroom instruction.” (Fountas and Pinnell, 2017, p. 222). The retellings or summarisations of most informal reading assessments are typically scored using a point system, similar to the BAS. See Appendix B for a sample BAS and scoring guide.

Retelling and discussing the reading seem to some researchers to be a valuable indicator of reading comprehension. Dewey’s belief that reciting what the child has learned is a social construct and behaviour seems to be one foundational piece of such assessments. Dewey believed that children can be taught to read, write, and converse, based upon the “...child’s social desire to recount his experiences and get in return the experiences of others...” (2015, p. 41). Leslie and Caldwell suggest that research supports the use of “...think-alouds...” (2017, p. 221) where the child must both paraphrase the text and elaborate upon it, as legitimate guided diagnostic assessments. They suggest that any assessment of reading comprehension should include measures of both literal and inferential comprehension. Leslie and Caldwell caution, however, that this type of assessment is challenging to score objectively and also time-consuming to administer, so its widespread use may not be practical. Fountas and Pinnell agree that teacher observation of student conversation about the text is one key to understanding how children are processing the reading. They suggest that teachers closely listen to student discussion in order to find “...evidence that students can think beyond the text to

³ The Fountas and Pinnell Benchmark system is known colloquially as the BAS, so for the purposes of this writing, I will use the terms interchangeably (Fountas and Pinnell, 2011).

infer elements such as characters' feelings and motives, larger themes and ideas causes of problems..." (Fountas and Pinnell, 2017, p. 217).

In addition to their practical concerns regarding this type of reading assessment, Leslie and Caldwell express concern that these informal assessments and conversations lack uniformity and reliability (2017). Stahl and García share a similar view, and find that it is impossible to come up with a quantitative score for a summary of the book, no means by which to code the retelling, and express concern that the Benchmark Assessment System (BAS) in particular has a "... lack of concurrent validation with any traditional comprehension test." (2017, p 257). Stahl and García suggest that the Developmental Reading Assessment 2 (DRA2), despite its very similar design, offers much more validity and reliability than the BAS, and has been subject to more stringent levels of field testing and examination for tester calibration (2017).

Fountas and Pinnell, developers of the BAS, refute claims of lack of a solid research base for their programme. They state that the BAS has been rigorously field tested, and is demonstrated to be both reliable and valid. Field testing for the second edition of the BAS was performed with 497 students, in 22 schools in varying socio-economic and geographical categories. One of their research aims was to determine reliability between the BAS and other more established reading assessments. In this field test, they compared the BAS to both the Slosson Oral Reading (Slosson) and the Degrees of Power (DRP[®]) reading tests, as well as Reading Recovery[®] assessments. The Slosson assessment measures isolated word reading, and the BAS texts were moderately indicative of the Slosson results. Fiction BAS books were correlated at .69, and the correlation of nonfiction BAS texts to the Slosson was .62. The relationship between the BAS and the DRP was also moderately related. The fiction BAS books correlated at .44 and the nonfiction texts at .42. Fountas and Pinnell assert that while the DRP[®] purports to measure comprehension, it does so by asking students to fill in missing words on short passages (cloze technique), unlike the BAS, which measures comprehension with a conversation about the text with the child. (Fountas and Pinnell, n.d., p. 12). The highest correlations for the BAS were with the Reading Recovery assessments, which are designed for first graders (Heinemann, 2012). Fountas and Pinnell assert that "...Reading Recovery has been recognised by the United States Department of Education as an effective and scientifically based reading program." (Fountas and Pinnell, n.d., p. 13). Fiction BAS texts, for levels A-N, were correlated to Reading Recovery at .94 and nonfiction at .93 The measurement of correlation between BAS and Slosson and BAS and DRP were for levels L-Z. See Appendix D for a grade level equivalency chart. During this enquiry, I used BAS at text levels N-T.

Fox and Alexander suggest that text comprehension can vary across different tasks and types of text: for example, students reading a highly interesting piece of text will comprehend it far more than those reading a nonfiction text about something unrelated to their interests. They criticized former models of reading comprehension as not incorporating "...phase-like and stage-like changes" (2017, p. 346). It can be argued that the BAS warrants this criticism- the BAS will measure one student's comprehension ability on one day, one book, and one genre. It is a snapshot into what a child can do on that particular task, but perhaps not a clear-cut, definitive measure of comprehension. Cain and Oakhill caution that there is perhaps no pure way to measure comprehension, due to the complex makeup of skills like vocabulary knowledge, decoding skills, fluency, and cognitive skills that are required to comprehend text and demonstrate proficiency. They suggest that researchers should acknowledge the limitations of comprehension assessments, and, wherever possible, use multiple measures in order to gain as much information about student processing as possible (2006).

Singer and Alexander (2017) evaluated 90 undergraduate students by asking them to answer three short-construction questions directly after reading a short high interest (based on the researchers' opinions) passage on each of the following types of media: digital newspaper, print newspaper, digital book excerpt, and print book excerpt. These researchers suggest that they chose to collect data using short-answer assessment because data gathered in a short-answer response can be far richer than that gathered in a multiple-choice assessment. While this method is different from the BAS in that it is a written assessment, and not a spoken comprehension conversation, the guiding principle of open-ended response remains the same. In fact, the scoring assigned by Singer and Alexander was remarkably similar to that of the BAS-comprehension; student comprehension was assigned a point value from 0-2, and any related but relevant information presented was given an extra point.

Reynolds and Daniel (2017) ponder the quandary of reading comprehension: in order to measure student comprehension, researchers must ask direct questions, but also be mindful to watch for insights that, while not answering that specific question, demonstrate comprehension. They suggest that appropriate scaffolds combine a planned teaching objective but also are malleable enough to adapt to student direction in pursuit of comprehension. They wonder if perhaps future research could be done to monitor teacher prompting and student responses in order to measure comprehension. Reynolds and Daniel suggest that videotaping lessons might offer teachers and researchers a wealth of data from which to measure and identify strong scaffolding for student comprehension (2017). Skidmore (2016) reminds researchers and teachers that successful teaching is

live, and incorporates necessary elements of unpredictability and improvisation, and as a result, teachers must be mindful to listen to students. Teachers should monitor for co-creation of dialogue and learning.

From the preceding review of literature, we can see that researchers tend to categorise measures of reading comprehension into two distinct areas. On one hand, strong arguments can be made for the use of normed and standardised tests of reading comprehension as they offer reliable data from which to draw meaningful statistical conclusions. On the other hand, a case can be made for the use of more informal methods to evaluate reading comprehension, which can offer a deeper understanding of each individual learner's skills in order to inform instruction. A balanced approach, incorporating both types of assessment, would offer teachers a well-rounded picture of each child's strengths and weaknesses in reading comprehension. In this vein, this research enquiry will incorporate the BAS as *one* measure of student comprehension, but will also rely heavily on discourse analysis, student interviews, and field notes to evaluate comprehension and offer a more in-depth understanding of each child's skills. In the next section, I will review the current literature surrounding using discourse analysis to examine reading comprehension.

2.4 Why examine classroom discourse as it relates to reading instruction?

Researchers suggest that building strong student discourse in both large and small group instruction will lead to improved reading comprehension and higher-level thinking for students (Boardman, Boelé and Klingner, 2017; Morocco and Hindin, 2002; Skidmore, Perez-Parent, and Arnfiel, 2003). As a pragmatic practitioner, my aim was to conduct research that might lead to improved student performance. A large part of the data collected during the enquiry was centred in discourse, and as such, it bears closer examination against the current literature.

In Ankrum, Genest, and Morewood's 2017 study comparing two primary school teachers using small group reading, the teacher who utilised a more constructivist, open-ended dialogue with her students produced higher and more consistent scores on their end-of-study data. Ankrum et al. used the DRA to measure student reading ability at the beginning and end of the study. The DRA is an informal reading assessment that consists of both an accuracy measurement and a comprehension measurement. Stahl and Garcia (2017) suggest that the DRA is more reliable and valid than the BAS, which lends further weight to Ankrum et al.'s work. Their results suggest that more research must be done to examine the effect of teacher-student discourse in small group reading, and its potential effect on reading achievement, an echo of the recommendations made by Skidmore, Perez-Parent, and Arnfield (2003) nearly fifteen years earlier.

Rodgers brings fresh attention to the term “...domain contingency...” (2016, p. 525), which was initially coined by Wood and Wood (1996) to mean when the teacher makes a decision about what to teach next based on student responses to the task, rather than what is next in a preordained set of tasks. Contingent teaching requires both skill and flexibility on the part of the instructor. Rodgers, focusing on accuracy in developing readers, studied more than 500 teacher interactions and found that the students with higher outcomes were eight times more likely to have had teachers the researchers identified as domain contingent. Rodgers’ work, with its emphasis on domain contingency in the instruction of reading accuracy, highlights a lack of literature on domain contingency in teaching reading comprehension. Rodgers, in the same vein as Ankrum, Genest, and Morewood (2017) and Skidmore, Perez-Parent, and Arnfield (2003) urges researchers to examine the specific types of help that teachers offer students during literacy instruction.

Morocco and Hindin (2002) suggest that for struggling readers, student discourse is a crucial piece to promoting stronger reading skills. Although it places challenging demands on these less-able readers, peer-led discussion helps students construct meaning from the text, support answers with evidence, and draw on their own personal experiences to make inferences about character development. Morocco and Hindin (2002) examined student discourse and teacher scaffolding in small groups of seventh graders. They found that the teacher’s ability to embed discussion of the characters in the text into conversation about the students’ worlds helped facilitate more student- led academic discourse. They suggest that her lack of explicit attention to the text allows students to speak freely and develop discursive skill, while her subtle modelling of use of textual evidence provides a positive model for students.

On the other hand, Morocco and Hindin (2002) compliment the teacher’s adherence to a pre-planned set of activities and suggest that that action fostered literary discourse among her students. It might be argued that this predetermined set of lesson tasks might stifle the natural flow of student conversation, and allow the lesson to become much more teacher-driven (Wood and Wood, 1996; Ankrum, Genest and Morewood, 2017). Consider the following example:

“Teacher: How did she respond to John in the hallway? What was the response?”
Student: She told him how she felt about the situation, about him teasing her.
Teacher: She expressed her feelings... Do you see how they are talking about how sometimes she responds, and then they give an idea on how maybe it would work if she did this one response a lot of times?” (Morocco and Hindin, 2002 p. 155)

It appears as though the discursive pattern here is very much the teacher serving as the expert and the student as the receiver of the knowledge. It might be that the teacher has a planned objective to mention the character expressing her feelings, and she is intentionally reframing the student's answer to meet her own agenda. Morocco and Hindin's work might be a valuable example of teacher and student discourse, but their conclusions that this teacher is fostering a good deal of student-led conversation might be overzealous.

Courtney Cazden (2001) contends that spoken language is the most common medium teachers use to convey information, and students use to demonstrate their understanding. Cazden suggests that the more recent curricular emphasis on thought process and strategic thinking as opposed to facts and procedures learnt by heart further underscores the importance teachers must place on discourse in the classroom. Teachers are being encouraged to manage the conversations in their classrooms in order to foster complex thinking among all of their students. In order to successfully direct conversations and encourage student growth, teachers will need to be reflective regarding their teaching practice and teacher- student discourse (2001).

Peter Johnston's perspective is that language is powerful in helping students make shifts in their processing and allowing them to become more strategic and effective readers. Consider Johnston's suggestion (2004, p. 37-38) to have students question *why* [my emphasis] the author made a specific choice. He states that this requires the student to place himself into the role of the writer, and read critically. Fountas and Pinnell (2017) suggest that a key component to effective guided reading lessons is the conversation among students and teacher during the lesson segment known as 'Revisiting and Discussing the Text.' Fountas and Pinnell are suggesting that in order to effectively read critically and make sense of the text, students must have opportunities to engage in meaningful discussion surrounding the text.

Aiming for improved reading comprehension, but taking a far more teacher-centric approach, is a reading strategy termed CSR. Bremer et. al (2017) describe the instructional strategy Collaborative Strategic Reading (CSR) as a research-based, reciprocal teaching approach to teaching reading. Bremer et al. claim that using CSR as an instructional approach leads to student gains in reading comprehension. The four main strategies within CSR are "... preview...click and clunk...get the gist...and wrap up..." (Bremer et. Al., 2017, p. 2). These strategies sound remarkably similar to the outline that Fountas and Pinnell recommend for a guided reading lesson (2006). The difference that seems to stand out is the 'clunk' strategy, where students identify the areas in the text that tripped them up or unknown vocabulary. Students are encouraged to use

known strategies, or ‘clicks’, written on cards, to help them work through their ‘clunks.’ CSR can be used in a whole class or a small group setting, and Bremer et. Al. claim that its use has resulted in improvement in reading for both elementary and middle school students, but neglect to identify the measure they used to evaluate reading skills.

Boardman, Boelé and Klingner, (2017) assert that CSR is not as formulaic as it is perceived, and acknowledged that a classroom model that produces higher levels of student discourse is ideal. Boardman, Boelé and Klingner, (2017) examined CSR as it was used in middle school language arts classrooms. They compared CSR to teachers’ typical instructional practices, and found that in CSR lessons, there was more student-teacher interaction. They also found that in the CSR classes, students were more likely to engage in student-student discourse than they did in typical instruction. They also found that the length of student utterance was longer in CSR classes, and the teacher acted more as a facilitator than as an expert conveying knowledge. This research showed “...students doing the heavy lifting of unpacking meaning throughout CSR lessons with teachers facilitating, rather than dictating what exactly would be learned and by whom” (Boardman, Boelé and Klingner, 2017, p. 17). The researchers admit that their research design allowed them to focus deeply on a small number of classrooms, and that additional research is needed to examine the impact of strategy instruction on literacy instruction.

From this section, we can see that researchers agree that discourse is an important component in reading instruction, although they do not always agree on the best methods of instructional use of discourse. Some researchers support a more prescribed, formulaic discourse in order to drive instructional objectives, while others suggest that more natural, student-led discourse fosters higher order thinking skills. Despite the differences, most researchers agree that student-teacher and student-student discourse is crucial in the development of reading comprehension skills. As indicated by the research, this inquiry will focus on discourse as an indicator of reading comprehension (Boardman, Boelé and Klingner, 2017; Cazden, 2001; Johnston, 2004; Fountas and Pinnell, 2017). The discourse analysis during this research project should offer more insight into reading comprehension, as well as examine any differences in discourse when students are working with e-text or paper text. The addition of e-text may change the discourse and the way students engage with text. In the next section, I will examine current literature as it pertains to technology in reading instruction.

2.5 The relationship between technology and reading instruction

As reviewed in the preceding sections, the current research does not offer a definitive answer regarding the best type of text for students to gain and demonstrate skill

in reading comprehension. Over the past thirty years, technology has evolved to become a significant component of classroom instruction. Rapid changes in technology and rise in its use with students have given rise to significant research efforts in recent years (Goodwyn, 2013; Goodwyn 2014; Mangen, 2016; Rose, 2011; Mangen and van der Weel, 2016; Fox and Alexander, 2017; Puentadura, 2006; Yardi, 2009; Yardi, 2010; Chell and Dowling, 2013; Hayhoe et al., 2015; and Passey et al., 2018). In this section, I will review some of the literature that is particularly relevant to the technological considerations of this enquiry, how those aspects impact student learning, especially in terms of reading comprehension, and explore some conceptual models that help ground the current thinking about use of technology in classroom instruction.

In their 2018 study comparing current technology-based reading intervention programs, Jamshidifarsani, Garbaya, Lim, Blasevik and Ritchie demonstrate that their Google Scholar searches for terms like “Technology-assisted” and “Technology-based” along with “Reading” are on a significant upward trend, and these researchers make the assumption that this growing interest in the impact of technology on reading instruction will continue (Jamshidifarsani et al., 2018, p. 429). In this vein, I have planned a small-scale study, examining the impact on student comprehension when instruction is conducted using books versus a Kindle device. Jamshidifarsani et al (2018) expressed surprise that only one of the interventions they reviewed was a tablet-based approach, and suggest that the array of tools offered by tablets, as well as the convenience and availability of these devices, might render tablet-based instruction in reading easier than some of the clunkier computer-based programmes. These researchers suggest that more work should be undertaken in this area, further supporting the rationale for my enquiry.

The term ‘m-learning’ is often used used to mean any learning that is conducted using mobile technology (Abachi and Muhammad, 2013; Alioon and Delialioglu, 2014; Grant, 2019). Grant (2019) suggests that educational researchers must be much more precise in their use of the term m-learning. Taking this caution into consideration, I contend that the umbrella term m-learning is not necessarily accurate to describe context of this enquiry. The ‘M’ [mobile] piece of the term m-learning is the part which my students will not experience in this setting. The Kindle devices are not connected to the internet, and the learning is taking place in the classroom setting, as it is for the paper-based group. However, Grant (2019) does suggest that future research might consider what scaffolds are offered by mobile devices, and what role context plays in the success of students engaging in m-learning. While I will not use the term m-learning to frame the research from this enquiry, it is important to note these suggestions as a timely rationale for this enquiry. Instead of m-learning, for the purposes of this enquiry, I will use the

term technology-based learning, in order to differentiate the type of instruction I am providing for the students from more mobile instruction. In the next section, I will present some of the perspectives on the skills students may need in order to succeed at technology-based learning.

2.5.a. Relevant digital skills

Researchers suggest that there is an ever-changing set of digital skills that learners require in order to successfully navigate current educational instructional content involving technology (Aliooon and Dclialioglu, 2014; Abachi and Muhammad, 2013; Passey, 2015; Bennett, Maton and Kervin, 2008; Akçayır, Dünder and Akçayır, 2016; Yardi, 2010; Neumann, Finger and Neumann, 2016; Passey et al. 2018). Yardi's (2010) suggestion that technical capital is crucial to students' abilities to access information serves as a key theme in this enquiry. Researchers have coined different terms for the same idea. Passey et al. suggest the umbrella term of 'digital agency' which encompasses "...digital competence, digital confidence and digital accountability..." (2018 p. 426). Some researchers use the term 'digital literacy,' largely credited to Paul Gilster, which implies an ability to be able to gain information digitally and to evaluate it (Pool, 1997). More recent researchers suggest that digital literacy is not as clear cut as checklist of skills that students and teachers must master, but more a framework encompassing a large, overlapping skill set. This set of skills is interwoven and complex, and includes a vast array of skills (Neumann, Finger and Neumann, 2016; Pegrum, 2019; Dudeney, Hockly and Pegrum, 2013; McDougall, Readman and Wilkinson, 2018; Passey et al., 2018). Most relevant to this enquiry are the skills related to reading e-text; namely multimedia literacy, which is the ability to make sense of text using sounds or video (Dudeney, Hockly and Pegrum, 2013). The objective of this research project is not to identify a term for these skills, but to examine the impact of the skills themselves on reading comprehension.

For the purposes of this research, students will be offered the option to use the text-to-speech function of their e-book. In keeping with Yardi's notion of technical capital, it will be important to explore the students' prior experiences with reading e-books and using text-to-speech tools as they pertain to multimedia literacy in order to disseminate the impact of these skills on reading comprehension. It is possible that this research will show that there is a set of digital skills that make accessing the curricula via e-book easier for students in order to boost their comprehension of the text. These skills might be considered digital literacy, digital agency, or technical capital. While the term

we use for them is not of central importance to this research, examining the impact of these skills on reading comprehension is of great interest.

Another important area to consider is the influence of the teacher's technical capital on student instruction. Each teacher will bring his/her own level of digital literacy to the classroom, which will in turn impact student experiences. Prensky (2001) suggests that the divide between students and teachers regarding their use of technology might be viewed by considering the students to be 'digital natives' as they have grown up with this technology and are, as native speakers, comfortable interfacing with technology on a variety of levels. Teachers, who are older, and new(er)comers to digital technologies, are considered 'digital immigrants.' Prensky's work might be criticized for its relatively black-and-white distinction. He suggests that all people born before 1980 are digital immigrants, and those born after 1980 are all digital natives. This sweeping generalization does not take into account younger people who do not access technology. Bennett, Maton and Kervin (2008 p. 779) state that "Generalisations about the ways in which digital natives learn also fail to recognise cognitive differences in young people of different ages and variation within age groups." They suggest that the creation of such a dichotomy might be considered a 'moral panic', grounded in Cohen's 1972 definition, and that the current call for dramatic change to educational practices might be a rash reaction to this somewhat extreme notion of a distinction between teachers and students. Other researchers agree that age is not the sole determinant of digital skill. It is possible that socioeconomic status, area of residence, or level of practice with technology education (Bennett, Maton and Kervin, 2008; Akçayır, Dündar and Akçayır, 2016). For the purposes of this enquiry, I do not assume that each participant is a digital native, although the participants are all born in the 21st century. The impact of each student's individual skill set and prior knowledge, both in traditional literacy and digital literacy, will be an important part of the thematic analysis of the data.

In keeping with research (Neumann, Finger and Neumann, 2016; Pegrum, 2019; Dudeney, Hockly and Pegrum, 2013; McDougall, Readman and Wilkinson 2018) suggesting that digital literacy and print literacy do not encompass a separate set of skills, but more an interrelated web of knowledge, it is important to consider not the *differences* between digital text and paper text, but the skills needed by all readers in order to successfully demonstrate comprehension. Neumann, Finger and Neumann (2016) suggest that more research is necessary to examine the transferability of traditional literacy skills to digital skills, and then the impact of that skills set on digital literacy. Examining this question in depth was beyond the scope of this research, but it is a lens through which I

will examine some of the qualitative data I collect.

Researchers argue that we may be examining this question of technology *versus* books from the wrong angle (Mangen, 2016; Rose, 2011; Mangen and van der Weel, 2016; Fox and Alexander, 2017). These researchers suggest that we must revise our current definitions of electronic reading in order to further examine it. Mangen states that we must consider that *all* reading requires interface-specific skills, and reading printed text is no different to reading electronic text. She maintains that we have been reading printed text for so long we ignore the user interface elements that successful readers must navigate in order to comprehend: page ordination, text features like table of contents and captions, publication data, and print on the binding and cover (2016 p. 246). Rose (2011) points out that we must draw some distinctions between digital experiences with text, like reading hyperlinks, and reading digitized text that began as a paper book, on some electronic format. Hou, Rashid and Lee speculate that when the presentation of an e-book mimics that of a paper text, the students are able to use their prior knowledge of text features and organization to facilitate efficient and effective processing. In the same vein, when students are asked to use cognitive capacity to navigate the text, they are doing so *at the expense of* using their cognitive capacity to comprehend the text (2017).

Mangen and van der Weel (2016) suggest that, in response to ubiquitous technology in schools, we must rebuild our framework for defining reading and literacy. In this new and broader framework, we must include at least three broad categories. The first category is preparation for reading, which includes orienting the reader to the physical and sociocultural pieces of the reading, the complexity of text, and any interface characteristics. The second component of Mangen's and van der Weel's proposed framework is the act of reading, which must include any environmental factors like noise level, any attentional and cognitive factors, any situational or cultural factors, and any ergonomic factors that might come into play during the reading. Finally, the framework should include reflection on the effects of reading: any learning that has taken place, any modification of prior knowledge, any cohesion or retention.

Mangen states that "...we need empirical research investigating the potential effect of various affordances of dedicated reading devices...on different facets of literary reading." (2016 p. 255). She suggests that more empirical work must be done to determine the differences between reading e-readers and paper text, especially when it comes to students' emotional involvement with the literature. Mangen suggests that her research reveals the "...fruitfulness of applying systematic empirical methods...[to

study]... the impact of digitization on reading literary texts...” (2016 p. 255). Rose’s 2011 findings indicated that, due to the proliferation of electronic resources available to educators, there is now a greater responsibility placed upon teachers to choose the best fit for their students. Rose suggests that teachers must continue to survey their students regarding text preference and continue empirical work surrounding digitized text. Mangen’s suggestions serve as a justification for the importance of my small-scale inquiry.

Cho and Afflerbach state that, given the rapid expansion of digital reading, it behooves us to “...develop detailed descriptions ...to specify... strategies that have universal application...” (2017, p. 128) as well as reading strategies which are unique to certain types of text, and to compare and contrast these strategies. They suggest that this research could lead to the development of specific instructional strategies for each type of reading in order to develop higher standards as well as boost student accomplishments. Goodwyn (2014) found that English teachers acknowledged that a shift in instruction is impending, and the next wave of research will need to consider pedagogical implications. Fox and Alexander (2017) concur that there is no longer a typical reader or text; in fact, modern readers must be competent at interacting with multiple text types. They suggest that perhaps we must reframe our thinking about comprehension to view it as a less linear, but more inter-related conceptual understanding of a variety of texts, which echoes the frameworks used to consider digital literacy (Pegrum, 2019; Dudeney, Hockly and Pegrum, 2013; McDougall, Readman and Wilkinson, 2018). From this section, we can see that reading books in paper format and reading books in electronic format are likely separate but related skills. This small-scale pilot study is designed to delve more deeply into the similarities and differences between reading digital text and reading paper text, and examine any impacts on comprehension. In the upcoming section, I will examine the current research surrounding the skills students need to be successful at all types of reading.

2.6 How might teachers foster stronger reading skills across all types of text?

Research shows that in order to successfully navigate all types of text, readers must use a variety of strategies in a flexible manner and that teachers should model these strategies and offer students frequent opportunities to practice them in small group settings (Ankrum, Genest, and Morewood, 2017; Coiro and Dobler, 2007; Skidmore,

Perez-Parent, and Arnfield, 2003; Johnston, 2004). In this section, I will examine the literature that relates to the impact of teaching practices on student reading skills.

Skidmore, Perez-Parent and Arnfeld (2003) found that in small reading groups among a selection of primary school students, the discussion during the reading lesson was primarily teacher dominated. The researchers argue that it might be beneficial for readers to spend more time during their guided reading lesson engaged in more open-ended dialogue with their teacher where the students are more equal partners in the conversation. Ankrum, Genest, and Morewood (2017) agree that development of flexible and productive reading strategies and critical thinking skills requires careful, effective discourse on the part of the teachers. Johnston (2004) concurs and offers some alternatives to what he calls a “QRE [question, response, evaluation]” discursive pattern (2004 p. 44). Johnston is particularly critical of this pattern of discourse, as he finds that beginning with a question always implies that there is a correct or incorrect answer. He suggests that teachers might begin with “Let’s see if I’ve got this right...” (2004 p. 54) and then summarise the conversation.

Coiro and Dobler (2007, p. 229-231) explored the behaviours that skilled readers exhibit when reading nonfiction text online and in paper books. Their findings regarding inferential reasoning suggested that these readers needed to use literal matching skills, context clues, and structural cues when reading a print book. On the web-based reading the students needed to use forward inferential thinking as well as prior knowledge of three-dimensional internet reading. Coiro and Dobler suggest that the online reading environment required the students to apply a group of physical reading actions (clicking, dragging, scrolling, etc) that were beyond what was required in a print book. Their conclusions that internet reading is both similar to and more complex than reading printed material may be somewhat outdated, as it can be argued that now, more than a decade later, students are both more familiar with and more likely to be tasked with touchscreen reading, similar to reading on an iPad or Kindle. Coiro and Dobler (2007, p. 229-231) suggest more research is needed to make a comprehensive argument in either direction.

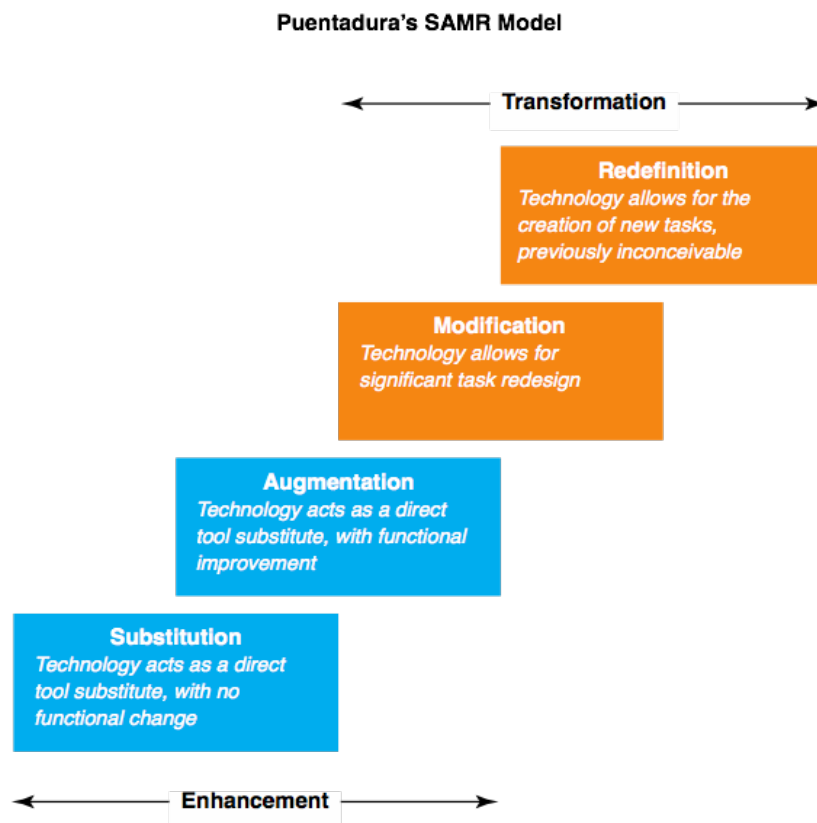
As suggested by researchers, more research is needed to determine the impact, if any, of e-books on student reading comprehension (Coiro and Dobler, 2007; Jamshidifarsani et al, 2018). To that end, I have planned a small-scale research enquiry which should offer further insights into this timely topic. The setting of the research, a guided reading lesson, will offer opportunities to examine student discourse as it relates to reading comprehension. I intend to closely examine the differences between the group of participants who work in a traditional format, reading paper books, and those who read

e-books. It is important to consider the instrument used to examine the differences in teaching with e-books instead of paper books. For the purposes of this research, I will use Puentadura’s (2006) SAMR model as a lens for examining the differences in teaching practices when adding technology to instruction.

2.7 How might we measure the addition of technology to instruction?

As technology becomes more ubiquitous in classrooms, researchers are attempting to create frameworks and definitions to use as instruments to gauge its impact on lessons (Puentadura, 2006; Soger, 2018; Neumann, Finger and Neumann, 2016). The Substitution, Augmentation, Modification and Redefinition model (SAMR model, see Figure 2), popularized by Puentadura (2006) serves as such a framework.

FIGURE 2: SAMR Model (Puentadura, 2006)—One framework for considering the application of technology during instruction.



According to this model, there are four distinct ways that technology can be implemented. *Substitution* (the technology acts as a simple substitute for the older tool, with no change in function at all), *Augmentation* (the new technology acts as a substitute, but also adds functional improvement). These two categories lie on the *Enhancement* end

of the model. At the other end of the model, *Transformation*, lie *Modification* (the task can be completely redesigned using the technology) and *Redefinition* (the technology allows the user to engage in completely new tasks that were impossible with the old technology).

Some researchers suggest modifications to Puentadura's model, including a consideration of context (Hamilton, Rosenberg and Akcaoglu 2016). They suggest that without considering the context in which the model is being used, it lacks some gravitas to be used in educational reform. I think it is possible to consider this weakness a bit further. For example, the model may require some adjustment when we take into consideration *perspective* as well as context. That is to say, something that is considered *redefinition* by a teacher who is newer to using technology may be perceived as *augmentation* by a student who has greater technical capital. For example, in my small-scale study, I might consider using the text-to-speech function a redefinition of learning to read, grounded in my own experience as a student who learned to read with only paper books. However, a student born after the advent of the iPhone and the Kindle might perceive the text-to-speech tool to be merely an augmentation, or addition of function, to the task of reading, depending on his digital skill set and technical capital. When classifying learning activities using this model, it bears considering the perspective of the person making the classification and his/her level of comfort with technology. In this case, the cautions of Bennett, Maton and Kervin (2008) come to mind: there are great individual variations when it comes to teaching and learning, and we must be careful not to over-generalise.

The SAMR model can be a useful tool for teachers to examine the purpose behind their use of technology in the classroom. Many researchers agree that more attention must be paid to careful examination of why and how teachers use technology in the classroom (Puentadura 2006, Mangen 2016, Rose 2011, and Mangen and van der Weel 2016). This enquiry is designed to further scrutinize the complexities of using technology during reading instruction. During data analysis, I will use Puentadura's SAMR model (2006) as a lens through which I will begin to examine the impact of the infusion of technology into small group reading instruction.

2.8 Conclusion

This enquiry is a small-scale exploration of the differences in student comprehension when reading e-books and paper books, measured using a standardised assessment, the BAS, as well as discourse analysis. Researchers suggest that classroom discourse is a valuable piece of data to consider when measuring student comprehension (Boardman, Boelé and Klingner, 2017; Morocco and Hindin, 2002; Skidmore, Perez-

Parent, and Arnfiel, 2003, Fountas and Pinnell, 2006). This review of current literature indicates that there is room for further research regarding the impact of type of text on reading comprehension in primary school students. The current data shows that in some areas, reading on an e-reader can be beneficial for students (Chang and Millett, 2015; Grimshaw et al. 2007; Wood et al. 2017; Karemaker et al., 2017), and in other ways, it may not impact student performance or may have a negative impact on reading comprehension (Jones and Brown, 2011; Singer and Alexander, 2017; Barnyak and McNelly, 2015; Hou, Rashid, and Lee, 2017). Much of the research that has been done has had mixed results, possibly due to a variety of variables in the studies.

It is possible that we might find that reading e-text is not a freestanding skill, distinct from paper reading, but a slightly separate type of reading encompassing some of the same skills and some new skills. When reading e-text, students may need specific instruction to access all the distinct features of this type of text. Students have been taught to examine fiction differently from nonfiction, and to attack reading a biography differently than they approach a graphic novel. Some research indicates that students should approach reading on an e-reader as another different type of task, with its own challenges and benefits (Mangen, 2016; Rose, 2011; Mangen and van der Weel, 2016; Fox and Alexander, 2017). It seems likely that students bring varying levels of technical capital to the reading table, resulting in varying ability to successfully comprehend e-books, and teachers themselves are potentially less comfortable providing instruction through digital media (Yardi, 2010; Alioon and Dclialioglu, 2014; Abachi and Muhammad, 2013; Passey, 2015; Bennett, Maton and Kervin, 2008; Prensky, 2001; Akçayır, Dündar and Akçayır, 2016). Much like in print literacy, the technical skills students bring to the table will vary, and may require explicit teaching in order to offer all students equitable access to the text. In this pilot study, I will examine the differences in reading comprehension between print text and e-text, when the two different types of text are used as the vehicles for instruction in small reading group instruction. It will be of interest to note the skills necessary for students to comprehend the text, and to explore the impact of prior technical capital on the take up of reading instruction.

Chapter 3

Methodology

3.1 Introduction

The overall methodology for this small-scale pilot study is action research (McKernan, 1996; Bryman 2008; Mullet, 2018; Gee, 2014; Merriam and Grenier, 2019; Barker and Rossi, 2011). Lewin (1946) is largely credited with coining the term action research. He describes action research as "... a comparative research on the conditions and effects of various forms of social action..." (Lewin, 1946 p. 37). Lewin describes a cycle where this action research involves the researcher beginning with a general idea, engaging in research to validate the idea, refining the idea and creating a plan for how to achieve the aim of the research. Researchers share the view that the objective of action research is to solve the problems that practitioners face and to improve practice through a cycle of action, reflection and further action (Lewin, 1946; McKernan, 1996, Elliott, 2015; Grenier, 2019; Lingard, Levinson and Albert, 2008). It may not involve large-scale data that is analyzed by traditional statistical techniques. Researchers suggest that although it may not be considered a completely generalizable form of research, the addition of knowledge and pedagogical skills derived from action research are themselves positive additions to the research field (Elliott, 2015; Merriam and Grenier, 2019).

In my dual role as researcher and practitioner during this enquiry, action research seemed a logical choice. I aimed to begin with a question, refine it and explore the pertinent literature, conduct a pilot study with my own students, and use my findings to both improve my own practice and explore further related questions, and so on. Elliott considers action research to be no longer an "...optional extra" but a critical component of the reflective practice of teaching. He suggests that teachers are responsible to either take on action research or abandon the decision-making power to policymakers and school leaders (2015 p. 19-20). Given this recommendation, action research seemed a natural fit for my teaching style and practice, and therefore a good fit for my small-scale study. There exists an emphasis in action research on the researcher and the participants working together to create change (Lingard, Levinson and Albert, 2008). This

cooperative nature of action research fell in line with my constructivist beliefs that learning is a social construct, created together among students and teachers.

Indicated by the gap in the literature and proposed by several researchers, there is considerable interest in the area of digital reading (Grimshaw, Dungworth, McKnight, and Morris 2007; Takacs and Bus, 2016; Troseth and Strouse, 2016; Karemaker, et al., 2017; Jones and Brown 2011). Mobile students, strapped school budgets, and schools in remote locations would all benefit from the use of digital books, if in fact student comprehension is equal to or better than comprehension when reading a paper book. By the same token, if students have more trouble reading digitally, it is a strong argument for reserving the use of e-readers for holiday reading and fostering student academic literacies using paper text. Teachers, parents, researchers and school leaders are all wondering if it makes sense to switch to a digital platform for reading instruction. As a reading specialist in a fiscally challenged state school, I set out to examine the differences in reading comprehension when students read digitally and when they read on paper. In this chapter, I will begin with an overview of the theoretical groundwork from which my research was conducted. Then, I will lay out the research questions that arose from the literature. I will explain the overall question driving my enquiry, and the sub-questions that arose during the research. At the end of this section, the reader should have a solid understanding of my ontology, epistemology, and research questions.

3.2 Research Methodology

In this section, I will lay out the theoretical beliefs that underpin my research. These theories form the epistemological and ontological basis upon which I have planned and conducted my research. In order to justify the use of a mixed-methods, small scale study, it is important for me to explain my epistemology and ontology.

3.2.a Does the use of electronic texts as the basis for small group reading instruction in 9–11-year-old students impact reading comprehension, as measured by the Fountas and Pinnell BAS and discourse analysis?

This is the overarching question of the research project. As use of e-books is increasing in school settings across the globe, researchers and educators want to know if this shift away from learning to read printed text will impact instruction and student performance (Grimshaw, Dungworth, McKnight, and Morris 2007; Takacs and Bus, 2016; Troseth and Strouse, 2016; Karemaker, et al., 2017; Jones and Brown 2011). When I mentioned my research project, teachers in my school setting were passionate about their opinions, based purely in anecdotal experience in their own classrooms and

families. It seemed to me at the outset that everyone had an opinion; I wanted to examine student data to form a more substantiated conclusion.

3.2.a.1 Can a combination of the Fountas and Pinnell BAS, teacher field notes and discourse analysis be used to compare reading comprehension for 9-11-year-old students who receive small group reading instruction using Kindle devices as compared to those who receive small group reading instruction using paper texts?

As the current research demonstrates, reading comprehension can be a nebulous skill to measure (Snow 2002; Gavelek and Wittingham 2017; Goodman, Goodman and Allen 2017). As such, educators have developed a variety of tools to attempt to identify student reading comprehension skills. During the enquiry, I used some of these tools, including the BAS, and Fountas and Pinnell's 2011 *The Continuum of Literacy Learning Grades PreK-8: A Guide to Teaching* (Fountas and Pinnell, 2011) to look for trends in comprehension and understanding of text. I also chose to use discourse analysis, using videoed segments of conversations during our lessons as data. Stables (2003) suggests *all* classroom discourse, including teacher-student, student-student, and student-self (the negotiation the student has between himself and the text) can be considered evidence for student comprehension.

3.2.b Definitions

Within the enquiry, it is important to keep in mind some additional topics that will require clarification and examination as they relate to the research question. This section contains terms that are important to define, not as distinct research questions, but as important knowledge base upon which the research is grounded. This action research enquiry attempted to find deeper clarity on the question of electronic text versus paper text, and then further narrowed it down to take into account the small-scale nature of the research. Additionally, are some terms that must be defined and clarified in order to set the research into appropriate context and provide the readers a common base of understanding.

3.2.b.1 What is an e-book?

In order to examine this newer type of technology, we must first define it and examine the features that separate it from other types of instructional technology. For the purposes of this research, I used Kindle Fire devices. These fell under the definition of e-book I used for this enquiry (Vassilou and Rowley 2008) in that the devices combined the print layout of a traditional book with digital features like a text-to-speech capability and an integrated dictionary. I chose Kindle Fire devices because they were

more affordable than iPad devices, and books were readily available to purchase through Amazon.

3.2.b.2 How is reading comprehension defined as it pertains to 9–11-year-old students who receive small-group reading instruction in a state school in Massachusetts, USA, bound by state and local curricular requirements?

To accurately study reading comprehension, it must first be defined. I set out to use recent research to define reading comprehension and arrived at a working definition. Researchers agree that as comprehension tends to be an internal process, it can be difficult to define and measure (Stables, 2003; Snow, 2002; Gavelek and Wittingham, 2017; Goodman, Goodman and Allen, 2017). The examination of current literature throughout this project, both as it stands and how it relates to the data collected here, will help further clarify this topic.

3.3. Theoretical framework

This research enquiry is grounded in constructivist epistemological beliefs. My epistemological beliefs are constructivist in nature; I believe that knowledge is a subjective social construct, and is a continual process. In addition, constructivist theory suggests that the researcher herself is also creating a social construct during the research. This theory aligns with the action research design of this enquiry. I adhere to the constructivist theory that knowledge is built from a set of social interactions, and is not absolute, but is continually being revised (Bryman 2008; Alvermann, Ruddell and Unrau, 2013).

The theory underpinning this research enquiry is that learning is constructed with the teacher/researcher guiding the students. Vygotsky (1978) coined the term ‘Zone of Proximal Development’ (ZPD) to mean that students would learn best when the task is just difficult enough to challenge the learner, but not beyond the student’s capability. The concept of ZPD illustrates the belief that knowledge is socially constructed. The student will need to build upon his or her established knowledge and beliefs in order to construct new learning. The teacher facilitates the learning, adding his/her own social constructs to the experience of learning.

The work of another leading constructivist helps to ground this research enquiry. John Dewey, a leading constructivist, believed that the new learning comes from “...transmission through communication. Communication is a process of sharing experience till it becomes a common possession.” (1916, p. 9). Dewey’s belief that “intentional teaching” (1916, p.9) is essential for students to progress further underpins this enquiry. The action research model of this project is grounded in my belief that my

teaching must be intentional and deliberate in order to meet individual students' needs and to allow each child the best chance to make progress in reading skills.

A constructivist framework lends itself to action research relying heavily on qualitative measures of data collection and analysis. The data collection took place in a setting where the small reading group, comprising the teacher and students, collaborating together to create learning. Alvermann, Ruddell and Unrau (2013) suggest that this type of framework is in keeping with the Vygotskian tradition, and exemplifies my belief that learning to read is an active process where the students have a significant role in the development of their learning.

During the data analysis, I closely examined teacher prompting and student responses as a key indicator of reading comprehension. Studying the discourse among students and teachers should offer insight into the pathways students are using to build upon their unknowns to learn new information, relying on social interaction (Alvermann, Ruddell, and Unrau, 2013). Reading comprehension and teacher-student discourse are indelibly linked and must be closely studied. Nystrand (2006) argues that research shows that classroom discourse can support reading comprehension, and suggests that the nuanced nature of discourse is best studied via qualitative methods such as ethnography, conversation analysis, or perhaps case study. Nystrand (2006) contends that these highly in-depth qualitative methods of research, combined with larger scale quantitative studies, will yield important conclusions about reading comprehension. I have attempted to blend both qualitative and quantitative research in my mixed-methods enquiry.

This research enquiry is grounded in a pragmatic ontology. As an action researcher and an active practitioner, my ontological leaning is towards the practical, or pragmatic, framework. Pragmatists tend to be willing to try a few methods and evaluate their success, then adapt their strategy based on what is successful (Scott 2016). Action research is a pragmatic form of research where the researcher is able to form questions and theories, examine data, and revise the questions as a result of findings (Lewin, 1946; McKernan, 1996; Johnson and Onwuegbuzie, 2004; Elliott, 2015). As a current practitioner working in a setting where I am doing just that on a daily basis, the research design felt like a natural fit. The pragmatic ontological construct can be exemplified in the responsive, or intentional, teaching that is typical of a guided reading lesson, which is the primary research setting in this enquiry. Pragmatism focuses on human inquiry as a place to test out theories and solutions, using the evidence collected during these interactions to reach answers (Johnson and Onwuegbuzie, 2004). As a pragmatic practitioner, I saw the value in the "...exploratory and explanatory power..." (AttrideStirling, 2001, p 403) of collecting and analysing qualitative data.

There is another pragmatic consideration that must be acknowledged in this section. Whilst working to collect data, I remained in my [paid] role as an interventionist teacher for the children in the study, and my professional responsibility was to improve their reading skills. Scott's assertion that "...data are generated through and used in both assessment and intervention with the role of the researcher as the one who promotes change" (2016, p. 556) seems to neatly encapsulate my dual roles as both teacher and action researcher during this enquiry.

As previously discussed, the constructivist and pragmatic beliefs underpinning this research invited a mixed-methods design. A mixed methods design is considered "...the class of research where the researcher...combines quantitative and qualitative research techniques, methods, approaches, concepts, or language into a single study..." (Johnson and Onwuegbuzie, 2004, p. 17). Pragmatically, using a quantitative tool that is already part of my teaching responsibility and is used regularly to assess student progress made sense. Teachers in the school use the Fountas and Pinnell Benchmark Assessment System three times per school year in order to make placement and grouping decisions and to guide their instruction. As a pragmatist, incorporating an existing assessment into my research design allowed me to continue in my role as reading interventionist with little interruption, whilst gaining valuable quantitative data. Ponce and Pagán-Maldonado (2015) suggest that a mixed-methods study, while a complex and demanding research design, lends itself well to research by teachers in classrooms, as it allows teacher-researchers to analyse the complex issues which are unique to student learning.

The bulk of data I collected was qualitative in nature, grounded in the constructivist beliefs that learning is socially constructed among the participants. I examined interactions between students and teacher, analysed discourse within the small reading group setting, and interviewed students and families. I was looking for evidence of gained knowledge by evaluating these social constructs. However, I did not wish to discount the value of the quantitative assessment. I was particularly taken by Stables' statement that "... qualitative research can make use of quantitative data... They key point in this context is that the numerical output does not directly measure quality of input...since contextual factors beyond the classroom also influence tested performance. The issue is not whether this is so, but how." (Stables, 2003). Stables validates my belief that quantitative data and qualitative data can go hand in hand, and the end result is a clearer picture of how factors impact student learning. My objective in this enquiry was to uncover deeper understanding of *how* student comprehension is impacted by text type. My aim here was to look beyond the quantitative measure and examine the instructional

discourse closely in order to form a richer knowledge base about reading comprehension as exhibited by the participants in my enquiry.

Researchers consider a mixed-methods design to be an approach that lends itself naturally to research by teachers in the field, and produces valuable data from which to draw conclusions to improve learning (Johnson and Onwuegbuzie, 2004; Ponce and Pagán-Maldonado 2015; Attride-Stirling, 2001). This mixed-methods, action research study was relevant in this setting because it allowed me to conduct research in a natural setting, working together with the participants to help drive student learning, while pragmatically taking into account that in today's American classrooms, student progress is often measured and reported quantitatively (Lingard, Levinson and Albert, 2008).

3.4 Conclusion

In this chapter, I have laid out my research questions, as well as my reasoning for selecting a mixed-methods study. My epistemological and ontological beliefs, rooted in constructivism and pragmatism, lend themselves naturally to a mixed methods study of the impact of e-books on student comprehension. In the next chapter, I will explain the research design and specific procedures I used to collect and analyse data for this enquiry.

Chapter 4

Methods

4.1 Introduction

In this chapter, I will offer the reader an overall picture of the research setting for this enquiry. The reader will understand my role as a teacher and a researcher, and be made aware of the type of school and population of students used for the research enquiry. I will then lay out the research design for the reader. I have included Figure 3, which reflects the mixed-methods design of the study. Next, I will describe the methods I used to collect and analyse the data during the enquiry. I conclude the chapter with a summary of how I addressed the reliability and validity concerns during the study.

4.2 Role of the researcher

I am currently employed by the City of X, Massachusetts, USA, as a reading specialist at Z Elementary School. I receive an annual salary for my work at Z Elementary and abide by the City of X Teachers' Contract. I conducted this research with full support of my building principal and my colleagues. My role as a primary literacy specialist is to support classroom teachers in the area of reading instruction by modelling lessons, offering professional development, helping class teachers improve daily instruction, and providing individualised instruction to struggling readers. The school has large class sizes, so in recent years, some of the support I have provided is to offer guided reading groups, which are part of core instruction for all students, to alleviate the teaching load of the classroom teacher. In order to create groups of similar abilities, our grade four team uses some flexible grouping among classrooms, so I end up with a group of similar readers who may or may not have the same class teacher. These students come to me for a twenty-minute guided reading session each day, then return to their classes for the rest of their instruction. These students do not have any diagnosed reading disabilities.

During the first half of the school year, I was working with a different group of children but performing the same tasks, so the students did not view my shift from reading teacher to researcher as significant. The other students in the classrooms were not made explicitly aware of any research being conducted, and for them it just appeared that I was continuing my typical role. Once the data collection phase was over, I transitioned some students to other reading groups and took on some new students in their place. In that sense, my dual role as a teacher and a researcher was seamless.

Being both a teacher and a researcher had some expected challenges. For example, the reading specialists in my building are often called upon to evaluate a new student's reading ability, to model a lesson for a class teacher, or to provide coverage if a class teacher is absent. In those instances, we are unable to see our guided reading students. While my colleagues were gracious and patient with me during my data collection phase, I did feel conflicted about asking them to shoulder all of those responsibilities for me. At times, I was not able to see my groups as I was performing other tasks that are part of my role in the building as a *teacher*, but not part of my role as a *researcher*. As noted in the limitations section, these interruptions in instruction may have impacted the results, but likely impacted it uniformly for all students. For example, if I was called upon to spend part of my day testing, I chose not to meet with any reading groups at all, so that I didn't offer some groups lessons and not others. Instead, I used those days to fulfil other professional responsibilities, interview parents, and manage data collection, in order to avoid any unfair advantage being offered to any of my groups.

4.3 Research setting/classroom context

The enquiry was conducted in a state school for primary grade students in X, Massachusetts, USA. The school has approximately 550 students, and serves students in grades Kindergarten-fourth [ages 5-11 years old]. This study involved 30 fourth graders [students are between nine and eleven years old] who received daily reading instruction in a small group, provided by me. It is important to note that all students in all classes at this school receive daily small group reading instruction, and some receive it from other reading specialists. If this research were not being conducted at this time, it is quite likely that these students would have been receiving their reading instruction from me in the same setting. No other part of their day was impacted by the research and their whole-class instruction remained the same. Until the time of the research, the students' reading instruction was carried out using exclusively print books, and remained that way for half of the participants as well as their non-participating classmates. Upon completion of the study, classroom teachers and reading specialists all redistributed students and reformed new reading groups, where we carried on reading print books in the same setting.

The students left their classrooms and we met at a small table in a separate area off of one of the fourth-grade classrooms. It is very typical that students come and go from the room for small group instruction all day long, and students in this school are very used to being pulled in and out of their classes for flexibly grouped instruction. There were several other small groups meeting nearby. The setting is quite loud, as it is not a separate classroom, but merely a table in a small hallway. Students are very

accustomed to working in such conditions, both with me and with other teachers throughout their day, and it did not seem to impact them. However, it is important to note that the audio quality of some recordings is poor, due to proximity to other students and teachers.

The design of this study was intended to mirror typical classroom instruction as much as possible. I intentionally structured my groups exactly as other reading groups are structured, our setting was the same as other students receive, and the flexibly grouped nature of the participants is typical. The students and their families gave both assent and consent to participate in the study, but it appeared that they forgot about it very quickly. It was an uninterrupted transition from typical instruction to research enquiry and back again. Felzmann concludes that research projects involving children must be designed to "...capture... interest and to minimize burden." (2009, p. 107). This research design mimics teaching practice, so is designed to be attractive to students. No students were abnormally burdened during or after the process, and the transition back to typical instruction after the data collection was seamless.

While I will be able to control the educational environment as much as is realistic in an action research setting, I will likely encounter some factors that are outside of my control, and may or may not impact my findings. Student motivation, an area of its own massive body of research, will likely come into play during the course of the enquiry. While I will be able to note it in the field notes, and perhaps draw some exploratory conclusions, examining student motivation during reading instruction is beyond the scope of this research, although it merits closer examination in due course.

Another area that is beyond the scope of this enquiry is that of parental engagement. Research indicates that parental involvement in reading with children can improve reading skills (Korat and Segal-Drori, 2015; Boerma, Mol, and Jolles, 2017; Korat, Shamir and Heibal, 2013). Boerma, Mol, and Jolles suggest that creating multiple opportunities for students to have focused discussion around character motivation and behaviour, *both at school and at home* [my emphasis added] will improve students' abilities to mentalize and thus improve comprehension. In creating this research design, I am only able to control the classroom piece. One might speculate that students who read on the Kindle Fire devices during the research project and are excited about the novelty might be more verbal about their reading, and therefore engage in more discussion at home. It is also possible that parents will be interested in the study, sparking more conversation. These considerations may impact the reading development of my students beyond my instruction. As much as possible, I will include any of these outside factors in my field notes and data collection. Due to the exploratory nature of this project, I may not

be able to investigate these factors during this pilot study, but will consider them for further research in due course.

4.4 Participants

The thirty participants in this study were all fourth graders at Z Elementary in X, Massachusetts, USA. Fourth graders at this school range from age nine to age eleven. The groups were formed based on reading level, as evaluated by the Fountas and Pinnell BAS, and class teacher schedules. Once the groups were formed, I randomly selected which group would read on a Kindle Fire and which group would read paper books. Fourteen students received their small group reading instruction on a Kindle Fire, and sixteen students received small group reading instruction in paper books.

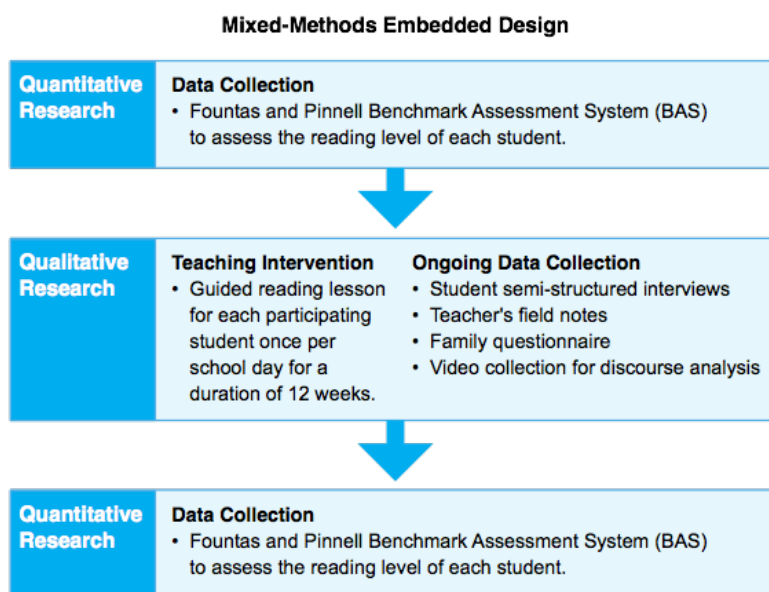
It is important to note that some children receive extra services beyond this daily instruction. During the rest of their school day, some of the participants were removed from their homeroom classes for ELL (English Language Learners) instruction in a small group. Other children received, as a component of their Individualised Education Plan (special education), pull-out or in-class support for social and emotional or behavioural needs. I did not select any students who receive special education services for reading, as those children are serviced by a licensed special education teacher in the building. Additionally, the school provided some standardised test preparation to some students after school (two times per week for an hour, from mid-January to mid-March), and seven of my participants took part in that programme. I have noted and described these extra services in the limitations section, as it may have impacted their pre-and post-test results. Of the sixteen students receiving instruction in paper books, two students received pull-out English Language Learner services, one student received special education services for social and emotional needs, and four children received extra tutoring services after school. Of the fourteen students who received instruction on e-books, two children received pull-out English Language Learner services, three students received special education services for social and emotional needs, and three children received extra tutoring sessions after school. The amount, type, and delivery of services

was typical for this school, and in keeping with what classmates who were not involved in my study received.

4.5 Research Design

As shown in Figure 3, the research design was a mixed-methods, embedded design. I used both quantitative and qualitative research to collect data over the course of the twelve weeks of action research.

FIGURE 3: Research design using mixed-methods and embedded design, blending quantitative and qualitative research.



I began the research by using the quantitative measure (the BAS) to determine each student's reading level and to form groups. Once the reading groups were formed, I randomly assigned one group of each level to be my e-book group, and one group of each level to be my paper book group. Each group at the same level read the same title, just in different format. Figure 4 contains a sample daily lesson schedule, which I used during the data collection phase of this pilot study.

In order to mitigate any preferential lesson timing, and to take into account that I would be teaching each lesson twice, I rotated the time that I took each group on a weekly basis. As an experienced practitioner in the field, I know that when teaching the same lesson twice, sometimes the first lesson is better, perhaps due to higher energy and motivation on the part of the teacher. I also know from experience that sometimes the second lesson is better, because the teacher has had a chance to teach the lesson once and work out any challenges. Additionally, the time of day of the lesson can dramatically

impact student performance. Some children are exhausted or overwhelmed by the later lessons in the day, while others have challenges getting started first thing in the morning. I wanted to eliminate these variables, so I designed a rotating schedule so that I was able to see different students at different points in the day. For each lesson, I followed the guided reading format as outlined in the literature review chapter. Classroom teachers were tolerant of this flexible schedule, and it did help that students were not missing the same class lesson each day.

The reason the groups were not exactly equal numbers is a necessary byproduct of action research in an actual school setting. By the end of the study, two students from the paper group had moved, so their participation was incomplete. I tried to keep groups of students at the same level from the same homeroom together, and by doing so, the group numbers were uneven. For example, in my O paper group, I had seven students from one homeroom. My other O group, who read e-books, comprised two students from one homeroom and three from another. Those were the 12 students in fourth grade reading at a level O, and it made logical sense to break them that way. Had I made groups of six and six, I would have been disrupting one class teacher twice, once for one student and once for six children. In my professional judgement, this would have been unnecessarily disruptive and not in keeping with a natural setting. As an action researcher in the field, I did not think it necessary to alienate my colleagues for the sake of even numbers.

FIGURE 4: Sample daily timetable outlining the researcher’s programme of work, including sample book titles and levels for each guided reading group.

Sample Daily Schedule for Research Enquiry

Period 1	Level N paper book Text: <i>The Skirt</i> by Gary Soto 5 students
Period 2	Level N ebook Text: <i>The Skirt</i> by Gary Soto 4 students
Period 3	Level P paper book Text: <i>Stone Fox</i> by John Reynolds Gardiner 4 students
Period 4	Level P ebook Text: <i>Stone Fox</i> by John Reynolds Gardiner 5 students
Period 5	Level O paper book Text: <i>The Vampire Mystery</i> by Gertrude Chandler Warner 7 students
Period 6	Level O ebook Text: <i>The Vampire Mystery</i> by Gertrude Chandler Warner 5 students

4.6 Analysis of Data

As outlined in Figure 3, I chose to use a mixed-methods model. I collected both qualitative and quantitative data. In this section, I will lay out the iteration of my analysis, and link it to the action research methods I used. It is important to note here that I had responsibilities as both a teacher in the field and as a researcher. While the data produced is rich and valid, it may be challenging to separate some of the analysis from typical teaching decisions. I have attempted to address that distinction in future sections (see sections 5.3.d.1 and 5.3.d.2).

4.6.a. Pre-enquiry data analysis

I began the research inquiry with the quantitative measure known as the BAS, which is discussed at length in sections 2.2.d and 4.8.h. The first piece of analysis, completed even before the official enquiry began, was the scoring of the BAS and placement of the students into reading levels according to their performance on this measure. As outlined in section 5.2, I analysed the BAS as part of my typical teaching practice, and then used the data collected as the starting point of data for the enquiry.

4.6.b. Ongoing data analysis

Upon commencement of the official data collection phase of the enquiry, in January of that school year, I collected several forms of qualitative data, as outlined in

Figure 3. The first type of qualitative data I collected, as described in detail in section 5.3, was field notes. Some of the notes I collected required ongoing analysis in order to drive instructional decision making, but most were purely for the purposes of the enquiry. I collected three types of field notes: standard field notes, comprehension forms, and running records. I used the standard field notes and running records as part of my daily teaching practice and analysed them in an ongoing fashion in order to meet for instructional needs of students and groups. It can be argued that these field notes, as they were analysed *during* the enquiry, possibly influenced my findings by directing my teaching. This impact is difficult to avoid in action research conducted in a school setting, given the nature of my teaching position as well as researcher role. However, when I used the running records and field notes over the course of the enquiry, I was only analysing them as a practitioner, not a researcher. I used them as data to drive my instructional decision making, and then set them aside for future study. For example, if I analysed a running record and saw that a few children were repeatedly struggling to decode multisyllabic words, I chose to address that in my word work section of the lesson. The analysis of the running record did impact the trajectory of the lessons, but I was not looking to draw any larger conclusions from that piece of data.

4.6.c First phase of post-data collection analysis: field notes

At the conclusion of the enquiry, I began analysis of the second administration of the BAS. This analysis offered me clear, quantitative data demonstrating the progress each child had made. As a starting point for analysis, I used it to identify some students who had made unusual progress. I flagged those students for close examination during the analysis of the qualitative measures. I outline the process in further depth in section 5.2.

I began my post-data collection analysis in May of that school year by examining the field notes, as described in sections 5.3, 5.4, 5.5, and 5.6. As discussed in depth in these sections, I used a thematic analysis, guided by the work of Braun and Clarke (2006) and Bryman (2008). Although I had already given the field notes and running records a bit of attention during the teaching phase of enquiry, I was able to examine them in depth here, primarily guided by the work of Braun and Clarke (2006). I will discuss the analysis in greater detail in sections 5.3, 5.4, 5.5, and 5.6.

4.6.d. Second phase of post-data collection analysis: video recordings

A second type of qualitative data collected during this enquiry was video recording of the comprehension conversation part of the lesson. As with the

comprehension forms, I did not analyse the videos until after the enquiry was finished. In fact, I did not even look at the videos until the students had already left the school for the year. The video analysis was the second type of data I analysed, after all the field notes. I chose to analyse it second because I had hopes that it would produce rich data. In section 5.4, I describe the steps I took to analyse the videos in greater depth.

4.6.e Third phase of post-data- collection analysis: semi-structured interviews

After analysing the video recordings, I began to analyse another type of qualitative data, the semi-structured interviews. As with the video recordings, I did not analyse these interviews until after the students had left for the school year. I have outlined the data collection process and analysis in detail in section 5.5. See Appendix H for a sample interview.

4.6.f Fourth phase of post-data-collection analysis: self-completion questionnaires

The last piece of data I analysed during this enquiry was the semi-structured interviews. As with the video recordings and interviews, I did not analyse these interviews until long after the students were no longer receiving instruction from me. I have outlined the data collection process and analysis in detail in section 5.6. See Appendix G for a sample questionnaire.

4.7 Ethics

Prior to conducting this enquiry, the methods were reviewed and approved by my supervisors and the ethics board at the University of Bath. I have adhered to the American Educational Research Association's Code of Ethics (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011), as outlined in the following subsections.

4.7.a Professional competence

In order to maintain professional competence, I recognised the limits of my abilities as a teacher/researcher, and only worked with the students in capacities for which I have been trained and in the role for which I am licensed by the Commonwealth of Massachusetts. The students were receiving instruction in the same amount and using similar instructional methods as if they had not been participants in the study. I did consult with other professionals as necessary in order to benefit all students. For example, when a conversation with a classroom teacher

regarding a student's progress in the rest of his school day was needed, I engaged in such a conversation in a professional manner, as I would have done if the child were not participating in the study. I communicated with parents and support staff on a regular basis, primarily to address the emotional or behavioral needs of the students. As a salaried staff member at Z Elementary School, I upheld all of my professional obligations to the school in addition to those of the pilot study.

4.7.b Integrity

As an educational researcher in the field, it is my responsibility to be "... honest, fair, and respectful of others.... in research, teaching, practice, and service." (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011, p.146). I demonstrated these qualities by engaging in a research project that was extremely close to my own daily teaching practices. In fact, it is possible that many classmates of my subjects did not realise there was research going on, and even the participants in my study seemed to forget on most days. Rankin (2018) reminds us that students must not feel that their grade would be impacted by the study, and I took care to ensure that the research design was so like typical instruction in order for students and parents to be assured that no grades would be impacted.

An important ethical consideration to take into account, as these are primary school children, is that the design of my study did not negatively impact the children's normal schooling. I was respectful towards my colleagues by trying to keep the timetable as similar to typical as possible, and I tried to minimise disruption to their classrooms by carefully selecting the participants. I was honest with my students, their families, and my colleagues about what data I was collecting and why, and I was happy to share the anonymized results at the end. (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011).

4.7.c Professional, scientific, and scholarly responsibility

In addition to my own professional responsibilities, I also adhered to the research and ethical standards as expected by the University of Bath and the wider academic research community.

4.7.c.1 Consent

According to the AERA Code of Ethics, "Informed consent is a basic ethical tenet of scientific research on human populations." (2011 p. 151). Prior to beginning the enquiry or working with any students, I approached my colleagues and the head of school to obtain verbal permission. Once they had offered approval, I obtained a letter of explicit

approval for the study from the school principal. After I had preliminarily selected the group of participants, I spoke to each of them individually to introduce myself and explain the purposes of the research. Then, each parent/guardian signed a permission form which indicated their consent. These letters were all written in "...language that is understandable to and respectful of research participants..." (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011, p. 151). In order to ensure that all families could read the consent form, it was written in both English and Spanish. I did not have any participants who did not identify their home language as anything other than English or Spanish. See Appendix A for copies of the consent forms from the head of school and those that were sent to families.

4.7.c.2 Assent

In addition to obtaining consent from the school leader and the guardians/parents of my students, I also obtained assent from each participant (Helzmann, 2009, p 104). After student selection and after parental permission was granted, I explained to the participants what I was planning to do during the study. In keeping with Helzmann's cautions (2009 p. 105) that group pressure might impact the assent process, I spoke to each child individually and encouraged each child to discuss the research with their families. No children expressed any concern or wanted to opt out, but if they had, I would have granted their request.

4.7.c.3 Anonymity

In keeping with current ethical standards (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011, p. 150), I disguised the identity of all participants by using pseudonyms for the children involved and removing the names of all adults, except my own name. When necessary, in order to include a sample record or form, I have removed any identifying information. I have identified the students, the school, and the city by pseudonym only in the research and in this dissertation.

I have only discussed any confidential information or data related to students in the event that I had "... appropriate...scholarly... professional purposes and only with persons authorized to discuss such matters." (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011, p. 150). While I was happy to disclose the results of my study to my colleagues and the school leadership, I did so in a manner that upheld student confidentiality. Digital confidential student data, videos, and notes were kept on a password-protected personal computer or iPhone. Quantitative measures (BAS) were kept in the students' personal files, available for classroom teachers, specialist teachers, parents and the school

principal to review, as is state-mandated protocol for all students. Qualitative measures, which included my field notes, interviews with students and families, and any notes regarding conversations with students were kept in a locked desk during the course of the enquiry. I have retained copies of all of these for the purposes of this study. In this manner, I can say with confidence that I have ensured that all confidential student information has been protected using "...reasonable precautions..." ((AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011, p. 149). During the planning phase of the study, I obtained explicit verbal and written permission from the school principal, as recommended by Rankin (2018), and the families of the students participating in the study. Examples of both letters of consent are contained in Appendix A. I assured families that participation in the study was optional, would not impact the student's grade should they choose not to participate, and they were able to stop participation at any point in the study. Every student and family gave both assent and consent, and no one declined to participate. (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011).

4.7.d Respect for people's rights, dignity, and diversity

In order to uphold this principle, I selected my students based solely on their reading level and homeroom class. The student participants were all roughly the same age, as they are in the same grade at school, but I did not discriminate against older or younger members of that group. As part of my daily role as a teacher at this school, I do not provide services for students who receive special education or have a documented disability in reading, so I did not select those students for my study. It is important to note that there were no students who receive special education for reading who were reading at the same level as my participants. Therefore, it can be argued that I did not deny those children the opportunity to participate due to their academic requirements, as I did not select their reading level for consideration in the study. I *did* select students who have documented disabilities in maths or who identified as English Language Learners. I also selected students who received special education support for behavioural or emotional reasons or identified disabilities. Therefore, I can comfortably state that I did not discriminate on the basis of "...race; ethnicity; culture; national origin; gender; sexual orientation; gender identity; age; religion; language; disability; health conditions; socioeconomic status..." (AERA Code of Ethics: American Educational Research Association Approved by the AERA Council February 2011, 2011, p. 147).

4.8 Limitations

In this section, I will present the limitations of this research. When possible, I have made attempts to minimise their impact on the findings.

4.8.a Student absences

Z Elementary has a high absenteeism rate, and my six guided reading groups were no exception. On many days during the data collection phase, I was missing at least one or two students from each group. Sometimes, these absences were because the children were with other teachers in the building receiving interventions, but most often the children were not at school. These student absences impacted individual student growth and academic progress. However, I did not notice a significant absenteeism problem in one group over the other, so we can assume that the results were equally impacted by student absence in general.

4.8.b Student relocation

Over the course of the enquiry, I had two of thirty students move. They moved abruptly and with no advance notice, so they do not have a final quantitative measure of data. A third child moved just at the end of the enquiry, so I was able to administer the BAS and obtain his March reading level. 10% of students moving suddenly over the course of three months is typical for this elementary school.

4.8.c Homeroom class teaching

As previously stated, these thirty students came from four different fourth grade homerooms. Each teacher has her own teaching style. While the teachers must follow both state and district curricula, each teacher instructs at a slightly different pace. The teachers do plan together weekly and share ideas and lessons with each other, and all class teachers are aiming to meet the same instructional objectives. However, it was impossible to control for learning the children received in their classes outside of their time with me.

4.8.d Home experiences

In any school setting, teachers cannot control what students do and see at home. I worked with a range of students during this enquiry. Some students may not have had any technology at home, some may not have had a literate parent or guardian, some students were homeless and lived in a shelter. Some students had parents who actively read to them at home and discussed our classwork, but many did not. Many students went home to an empty house or a home with an older sibling in charge. It is important to note that any of these experiences may have impacted student results, and in an action research project in a school setting, it would be naïve to assume that all results are purely from in-school teaching.

4.8.e Supplemental tutoring

In January, Z Elementary received grant funding to offer tutoring to students reading below grade level standard. As I had already chosen my groups, I couldn't avoid some of the students being offered this supplemental tutoring opportunity. The tutoring scheme offered students two hours per week of tutoring, after school, with a teacher employed by the school, for six weeks. Three of my Kindle group students participated in the tutoring, and four of my paper group students took part. In the data analysis section, I will disseminate the effects tutoring had on each individual child. Since it was reasonably proportional, I am confident that this extra tutoring will have negligible impact on the overall results of this enquiry.

4.8.f Kindle device book variations

For the purposes of this enquiry, I purchased several titles on Kindle Fire devices. The selection process was as follows: First, I found paper books in Z Elementary's book room that met the instructional objectives required by state and district curricula. Then, I searched Amazon to see if these titles were offered on Kindle Fire devices. I was left with a short list of acceptable titles, and I further winnowed it down by only selecting books where text-to-speech features were enabled in the Kindle. However, once instruction began, it became obvious that not all Kindle books were created equally. Some, including *The Moon* by Seymour Simon, are merely scanned into a digital format. This book offered students no opportunity to change the font, colour, or size of the print. *The Moon* is a stunning picture book with complex illustrations and photographs, but they were reproduced in such a minuscule fashion that students were unable to appreciate them. I have noted in the analysis section that students complained about print size being too small. On the other hand, books like *Ray Charles, Young Musician* by Susan Sloate, allowed students to enlarge the font, change the colour, alter the background colour, and 'read' the text-to-speech in a natural voice.

I compensated for some of these variations by having all students read a variety of books, and most of the Kindle books offered many of the features the children enjoyed, like changing the colour of the background screen and the font. I noticed that most children tended to gravitate towards the same font and colour each day and were happy when the books we read offered that option. This limitation is a legitimate concern for older books and books which are designed for print, not to be read digitally, like *The Moon*. In a larger-scale study with a bigger budget, more care could be taken to ensure that only books with the same features are purchased.

4.8.g Kindle Fire device features

While not truly a limitation of the study, as it was the same for all students, I do feel it is important to note that the Kindle Fire e-readers have a tool that I was unable to allow students to use. Due to City X's technology policy, I was unable to allow the students to connect to the internet. When a Kindle Fire is internet-enabled, there is a feature called Word Wise™. This feature offers students assistance with words the Kindle perceives as challenging. Short definitions automatically appear above pre-set, 'difficult' words. While it is a feature that students will be able to use in the real world, it was not a feature they could avail themselves of during our sessions. I do feel that introducing the concept of an unnamed, unknown entity who chooses the difficult words and defines them for a student would have added unnecessary variables, so I was somewhat relieved that this feature was not enabled during this enquiry. It seems it would be worth further study to examine the impact of Word Wise™ on student comprehension, but this study did not have the scope nor the resources to do so.

4.8.h Fountas and Pinnell Benchmark Assessment System

As an action researcher in my own place of employment, I had to create a research design that fit my professional responsibilities as well as my personal and professional ontologies. I used the BAS as the quantitative measure of reading comprehension because it is a required component for all learners at this school, and because I am confident in my ability to analyse data from this assessment. The BAS is widely used and accepted as a valid measurement of reading comprehension. It must be acknowledged, though, that while the BAS is a commonplace assessment, it is not a normed test, and therefore its results may be nonstandard. Critics of the BAS suggest that it is a subjective test, lacking external calibration and that any measure of reading comprehension is merely an informal account of what the child can do at one point in time (Leslie and Caldwell, 2017; Stahl and Garcia, 2017; Cain and Oakhill, 2006). As discussed in the literature review, the creators of the BAS suggest otherwise, and suggest that it correlates with other reading assessments (Fountas and Pinnell, n.d, p. 12). It is important to note here that I chose the BAS as the quantitative measure for pragmatic reasons, and it is considered in our school setting to be a valid measure of a child's reading level. I do acknowledge that it is not a purely quantitative measure in the traditional sense, and while I attempted to mitigate some variability in the test administration, it is important to note that the student results on the BAS may or may not be a true, definitive measure of their ability to comprehend text.

Chapter 5

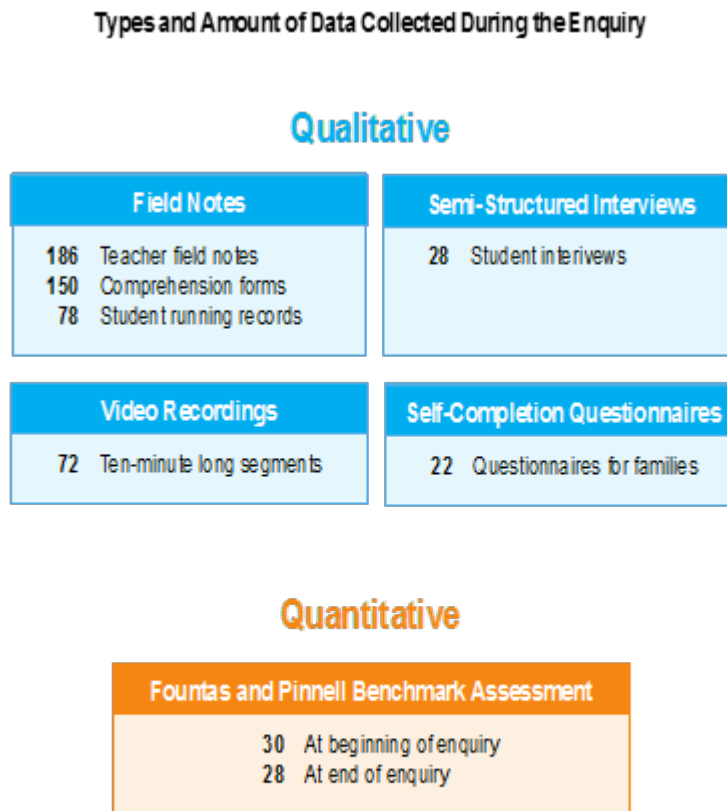
DATA COLLECTION AND ANALYSIS

5.1 Introduction

Grounded in the pragmatic nature of research by a practitioner in her field, this project holds with the fundamental tenants of action research (McKernan, 1996; (Bryman 2008; Lewin 1946) as outlined in Chapter 3. As such, the data collected was rich and varied, and the researcher's voice is clearly present throughout. In this section, I will provide the reader with a summary of each type of data collected over the course of the enquiry. As a mixed-methods study, I also collected quantitative data at the beginning and end of the project, and this data is outlined in the latter part of Chapter 5. Figure 5 will offer the reader an overview of the data collected and analyzed during this enquiry, which is described in further detail in the upcoming sections. In section 5.7, I offer an example of the process of analysis for one student, in order to provide the reader a lens into the iterative process of data analysis for this enquiry.

After describing each type of data in detail, I outline the methods I used to analyse that type of data with a view to offer the reader insight into the process used during analysis. Guided by the work of Braun and Clarke (2006), I used thematic analysis to identify, code, and then analyse themes that occurred across these different types of data. In this mixed-methods enquiry, I collected and analysed the quantitative data (the BAS) at the beginning and end of the enquiry. Then, during the action research and data collection phase, I collected a variety of qualitative data. Once the data collection phase was complete, I analysed the quantitative data first, although I collected it first and last. I have described this process in detail in section 5.2 and included specific information on the BAS in section 2.3. Once the analysis of the BAS was complete, I began analysis of the quantitative data, as outlined in section 5.3, 5.4, 5.5, and 5.6. The data analysis was somewhat iterative, in that the results of the BAS led me to identify certain students who had made exceptional progress and closely examine the data they produced. While I lay out the data collection and analysis in a linear fashion, I had access to all the data points during analysis, and revisited relevant segments as necessary. I will further describe this cyclical process in the upcoming sections.

FIGURE 5: Graphic representation of the types and amount of data collected during the enquiry.



5.2 Quantitative Data: Fountas and Pinnell Benchmark Assessment System

The Fountas and Pinnell Benchmark Assessment System is a widely used assessment tool, developed by Fountas and Pinnell to inform instruction. I chose the BAS as the quantitative measure for this enquiry due to pragmatic considerations. It is already a requirement for students at this school, I am trained in its administration, and it offers a reasonable picture of the child’s reading comprehension skills and weaknesses. Research suggests that the BAS is moderately correlated with normed reading assessments (Klingbeil et al, 2015; Fountas and Pinnell, 2017; Bongle, 2018).

The BAS consists of a passage for students to read, where the test administrator takes a running record to evaluate accuracy, followed by a comprehension conversation- a set of questions that the teacher asks the student to guide the discussion. This comprehension conversation is used to measure literal and inferential understanding of the text. While the BAS is used to place students into appropriately levelled reading groups, its main objective is to offer a snapshot of the child's skills and weaknesses and therefore inform instruction. See Appendix B for sample BAS.

The BAS is administered to all students at Z Elementary in early December, early March, and early June. These intervals align with report cards so many teachers use the information gained by the BAS administration to write narrative reports on each child. The reading staff also use the BAS scores to form reading groups and determine which children need intervention or enrichment. We expect to chart a child's progress throughout the year using the BAS as well as district and state high-stakes testing and classroom teacher assessments. See Appendix D for the grade level equivalency chart used at Z Elementary School.

I conducted this enquiry during the December-March interval of the year. I received both verbal and written permission from my school principal [Appendix A] to conduct this research in our school setting. As part of my typical responsibilities as a reading specialist, I administered the BAS to third and fourth graders, and my colleagues did the same. From the entire fourth grade, I selected the students for my study. I formed two groups reading at each text level, taking into account classroom teacher schedules and personality conflicts among students. The BAS results indicate a student's instructional reading level- this level is identified by a set of skills that the student has mastered and a set of skills s/he needs to master in order to progress to a more complicated text level. Once I had two groups of each level, I randomly assigned one of each level to be my paper book group, and the other to be my e-book group. Once my groups were formed, I obtained permission from families [Appendix A], offered the e-book groups some practice with using the electronic tools, and began helping students become accustomed to the routine of our groups. I did not begin collecting data until January 2, but I used the BAS administration from December to form my groups and plan my instruction. This first BAS was the first piece of quantitative data collected and analysed during this enquiry.

Between January and March, I collected all the qualitative data, as outlined in sections 5.2, 5.3, 5.4. and 5.5, but did not analyse it for research purposes. Then,

beginning on 8 March, students were assessed again using the BAS. In order to mitigate test administrator error or bias, I had the same test administrator (sometimes a classroom teacher, sometimes another reading specialist, sometimes myself) perform the BAS for each student. The only time this was not possible was for four students who had their classroom teacher administer the December BAS, but by the March BAS the teacher was not at school due to a family medical leave. For those four students, I administered their BAS in March. Every teacher has been trained in administering the BAS the same way, so as a quantitative measure it is reliable and valid, so one would hope that the difference in test administrator wouldn't impact the results. However, it is important to note that this unintended variable is an unfortunate reality of action research in a school setting.

5.2.a Analysis of Fountas and Pinnell Benchmark Assessment System

The quantitative measure included in this study was the Fountas and Pinnell Benchmark Assessment System. I used the BAS scores to form reading groups of students at the beginning of the enquiry. I used the end of enquiry BAS to plot student progress against what would be typical progress for the middle interval of the year. Using the chart in Appendix D, I determined that typical progress for a fourth-grade student from December to March would be one text level. Students who gained more than one text level over the course of the interval exceeded expectations, while those who remained the same or decreased in text level did not meet expectations. I was able to determine, for each student in the study, progress as compared to the norms set forth by the BAS. These pieces of quantitative data were helpful in looking at trends for the entire enquiry. As Maine and Shields (2015) did, I chose to use a standard measure of reading performance as a measure of comparison by which to measure student progress instead of a control group. In the school used in this study, teachers use the Fountas and Pinnell Progress Monitoring by Text Level Chart [Appendix D], so that is what I used as the standard.

Although I collected the second set of quantitative data at the end of the enquiry, it was the second set of data I analysed. The outcomes of the first set of BAS data were critical in determining the makeup of the groups, and the outcomes of the second set of BAS data were a key indicator of student growth over the course of the enquiry. I used this quantitative data to produce Figure 6, Figure 7, and Figure 8, as well as to draw conclusions about student progress in reading skills over the course of the three-month enquiry.

With the BAS data, I was able to identify the students who had made accelerated growth and those who had made no growth. I flagged these students as potential sources of rich data. I kept the chart of student progress up on a wall so I could refer to it during analysis of the quantitative data, which I will detail in the upcoming sections. In this way, the BAS data did drive my analysis, as I was constantly checking to see the student's progress when I was watching him speak on video, or when I was reading her interview. It is also important to note that the BAS data is the data that the school leadership were most interested in, as the quantitative data is easily measured and reported. I offer a specific example of the way the BAS results drove my data analysis in section 5.7.

5.3 Qualitative Data: Field Notes

For the purposes of this research, I used what Bryman terms "Full Field Notes" (2008 p. 420). During the course of the enquiry, I collected and analyzed three different types of field notes. In sections 5.2.a-5.2.c, I identify and describe the three types of field notes I collected during this project. These descriptions are followed by a section outlining the how and when I analysed this type of data, guided by the works of Braun and Clarke (2006) and Bryman (2008).

5.3.a Field notes

It is common practice in this school setting for teachers to take copious and detailed notes on each child's reading performance. It felt like a natural extension of my teaching practice to use notes as a foundational piece of data for this enquiry. Researchers agree that field notes are one of the artifacts that qualitative researchers use to determine how people make meaning of their surroundings (Bryman, 2008; Merriam and Grenier, 2019). During the course of the enquiry, I wrote 186 field notes [Appendix E]. I took approximately one note for each group for each lesson they received. The times I missed a field note were due to classroom interruptions, like fire drills and assemblies, where we began the lesson, but it was quickly disrupted. The field notes collected during the enquiry were more detailed than the typical notes I would have taken during reading instruction. In typical instruction, I might take notes on a sticky note, on a scrap of paper, or in a document on my computer. During the enquiry, I was disciplined about taking one note for each group each day, using a blank notebook page. A field note for a particular group might contain my notes on a particular child's reading fluency, snippets of conversation about the book that were particularly relevant or notes on the child's emotional state that day. In my field notes I also noted the teaching objective for the lesson, any absences or disruptions to the schedule, and any word work or phonics skills I incorporated into the lesson. I also added my own notes and opinions about things I found

challenging as a teacher or observations I made as I was working. Bryman (2008) notes that field notes are for largely for personal consumption, and the researcher is definitely evident in such notes. Upon examination, I could see my teaching practices clearly reflected. Merriam and Grenier (2019) suggest that in qualitative research, the data collected is rich and varied, and my field notes were indeed both. My field notes are clearly jotted down whilst teaching, and some days yielded greater insight than others. Another researcher would be able to draw similar conclusions from these field notes, but as the voice of the researcher is very strong, these are likely the most subjective of the qualitative data I collected. In order to try to collect a somewhat more standardised field notes, I developed a secondary format, which I will discuss in the next section.

5.3.b Comprehension form

The second type of field note I collected during the enquiry was a form that I developed for this enquiry [Appendix C]. This reading comprehension form delineated the skills each child is working towards at a particular text level. I developed this form in order to focus my field notes on one child per day, and really isolate and identify the skills s/he was demonstrating that day. I collected 150 of those comprehension forms. I attempted to complete one of the comprehension forms per day for one student in each group, but as with field notes, there were days when classroom disruptions were an obstacle to completion. The forms are not something I would use in my daily practice, although they are based on the instructional objectives guiding my teaching. The comprehension forms were identical for each child, and the voice of the researcher is muted due to the checklist nature of the forms. Another researcher or teacher would easily be able to determine each child's strengths and weaknesses on the task based on the form. The structured format was helpful during data analysis, as I will discuss in section 5.3.d.

5.3.c Running record

The third type of field note I used during the enquiry was a standard running record form [Appendix F]. I tried to take a running record on each child every few days, and in total I had 79 running records to analyse. Appendix F for a sample running record. I used the running records to analyze the accuracy and fluency of each child's reading. A running record is not a measure of comprehension, but fluency and accuracy are important to overall literacy ability, so I felt these were important field notes to take, analyze, and include in the study. The running records are extremely objective and are designed to be read and interpreted exactly the same way by anyone who knows how to complete a running record. The only subjective part of a running record is the notes on fluency- for example, I might have written 'choppy reading today' or 'phrased and fluent'

based on my own observations. I typically take running records during instruction and use them to guide my teaching. These running records were not different to the ones I would take during a typical lesson.

5.3.d Analysis of field notes

During the course of the inquiry, I was working in the role of practitioner as well as researcher. This is common in action research, and can produce rich, deep findings (Bryman 2008; Mullet, 2018; Gee, 2014; Merriam and Grenier, 2019; Barker and Rossi, 2011). In this section, I will lay out the iterative nature of the analysis, and how the different roles drove analysis.

5.3.d.1 As a practitioner

As part of my typical practice, I do examine the field notes and running records I take during teaching. I am searching for student successes and struggles, looking for accurate and phrased reading, and noting areas of weakness where I should focus my teaching. I tend to look at these notes while planning the upcoming week's lesson. Occasionally, at a meeting about an individual child, I might share some findings from the notes. I am very likely to share the information found in a running record, including an error analysis, with the homeroom class teacher. As I only developed and used the comprehension form for the purposes of the study, I did not analyse the data yielded from that form as part of my typical daily practice. Use of these notes drove some instructional decisions and allowed me to continue to help students achieve the course objectives. This iterative process of analysis is inherent to my daily teaching and allows me to provide students the instruction they need to improve as readers.

5.3.d.2 As a researcher

Once the data collection phase had finished, and I resumed teaching my typical schedule, I stopped using the comprehension form, and returned to my typical practice of notetaking. I set aside the field notes I had collected and finished the year as a typical practitioner. Once the school year had finished, I began to analyse the field notes. I was now no longer working with those specific students and could look at the notes with an objective eye.

I set out to examine these notes using thematic analysis (Braun and Clarke, 2006 and Bryman, 2008). I first set out to determine the important themes. I found, after reading and rereading the notes, that I could see several topics repeated. Often, I had written a word like 'fluency' or 'prompts' in my notes, and since I wrote it on multiple occasions, I considered that to be a theme of importance. I used a more inductive approach to analysis in that I allowed the data in front of me to drive the themes (Braun and Clarke, 2006 p. 11). By reading and rereading the notes after I was done teaching the students, I was able to see themes emerge *without* the need to address them in my

instruction. Therefore, I was able to obtain a large amount of data that was more objective than the data I collected and used as a practitioner. I coded these themes using highlighters and notes for each theme, marking up the field notes. Then I placed the field notes into piles for each code, and I was able to see that there were some themes that were much larger, both physically and metaphorically, than others. I used the themes I found in the field notes as temporary categories as I set out to code the rest of the data I collected, which I will discuss in further sections. I used the results of the BAS to highlight certain students who had made outlying progress, so at times this process was iterative. I also found that after the video recording analysis, described in the upcoming section, I did return to the field notes to confirm or deny the themes I had identified.

5.4 Qualitative Data: Video recordings

Another type of data I collected was video recordings. I recorded a digital video segment approximately once per week for each group, for a total of 72 ten-minute segments. Before beginning the official study, I turned on the video recorder (a password-protected iPhone on a free-standing tripod) and took some practice videos of the students, so they would be comfortable with the recording device there. This was an attempt to ensure behaviour as close to typical as possible during the actual data collection. Whilst teaching, even on days I wasn't videotaping, I often left the phone set up as if it were recording so the children soon became very used to it. At times, a few of them would pull a silly face at the video, but for the most part, they participated in the group very naturally.

I chose to take video of each group each Wednesday, and I was mostly able to keep to that schedule. One week we had school cancelled due to a weather emergency, so I took the video on a Thursday. I felt that by taking video on Wednesdays, I was getting a reasonable sample of data as children were settled into the routine of the school week. I only recorded the comprehension conversation part of the lesson (about 7 minutes per group), as I wanted to be able to analyse the discourse and look for evidence of comprehension. I did not record the book introduction or the actual reading pieces of the lesson. I determined, at the outset of the enquiry, that the field notes and running records would be sufficient evidence of student responses and behaviour in other parts of the lesson. During analysis, I found myself wishing I had recorded the entire lesson. In another similar research project, I would want to examine the data that could be yielded by recording more of the lesson.

5.4.a Analysis of video recordings

It is important to note here that I recorded the video segments over a period of twelve weeks of instruction. I did not watch or analyse the videos during this time, as it is not part of my typical practice as a practitioner to analyse video of lessons. Similar to the analysis of the field notes, I did not begin analysis until after the current students had finished school for the year and moved on to another school building. As a researcher in the field, I did not want anything in my analysis to impact my enquiry by influencing my instructional practices, and I wanted to be able to analyse the data in a more objective capacity.

In order to analyse the video segments, I first watched or listened to the video sessions to select the richest segments. I watched each segment and was able to note the specific segments I wanted to return to for analysis. Discourse analysis is a constructivist method, in that its very nature relies on the social constructs created between the parties involved- in this case, the students and the teacher. Implicit in discourse analysis is the acknowledgement that the reality is created through the lens of the researcher (Bryman, 2008). As with the field notes, I was listening for words and themes that came up frequently. Once I had selected the segments that yielded the richest data, I set about transcribing them. Braun and Clarke (2006) acknowledge that this process is time-consuming but crucial to the research process. I concur. At the time, it felt laborious, but transcription forced me to closely examine the actual words that were said by the students and teacher. As it was important to analyse the discourse, having to hear it, write it, and then analyse it resulted in my being extremely familiar with the data even before I began to write about it. I was able to see that many of the themes I identified during the analysis of field notes were echoed across this form of data. I coded these transcripts in much the same fashion as the field notes- first taking notes, then highlighting different themes in different colours, and finally organizing the transcripts into piles of paper for each theme.

Discourse analysis, as opposed to conversation analysis, incorporates a variety of discourse, including the naturally occurring conversation studied in conversation analysis, but also teacher-directed conversation, interviews, and written documents (Bryman 2008; Mullet, 2018; Gee, 2014; Merriam and Grenier, 2019). In this enquiry and analysis, I was examining all the discourse during the students' comprehension conversation, looking for evidence of comprehension or lack thereof. While analysing, it was important to acknowledge that one drawback here might be lack of objectivity due to my role as teacher and researcher (Barker and Rossi, 2011). I attempted to control for this bias by waiting to analyse the bulk of the data until the school year was over, but it bears acknowledgement, as researcher presence is certainly a factor in action research.

While I have laid out the data analysis as a linear process, it was in fact much more cyclical, especially with the three forms of data discussed in sections 5.2, 5.3, and 5.4. I used the BAS to identify students who were potentially unusual data points, and then allowed the field note themes to direct my further analysis. Then, when watching the videos, I made note of those specific children so I could return to that video segment for further close analysis. I also noted when certain themes came up by noting the minute of each recording, so I could go back to it. It is in this way that I selected the segments I found particularly interesting to include in the final dissertation. I often found myself looking at the BAS progress chart multiple times during analysis, then examining the field notes, all while listening to the video recordings. I repeated this process often, circling round and round in further depth each time, in order to produce meaningful themes and conclusions. I offer an example of this type of analysis in section 5.7.

5.5 Qualitative Data: Semi-structured interview

I chose to use a semi-structured interview model to collect data from students. See Appendix H for a sample completed interview. In keeping with qualitative research tradition and my constructivist ontology, I wanted to be able to examine student perspectives and thoughts during this particular context (Merriam and Grenier, 2019). I chose a semi-structured interview because it felt like the best fit in my role as a teacher; I could have a list of questions I wanted to ask the students, but I could allow the conversation to flow naturally and differently for each student. I also felt that I needed the leeway to ask each child individual clarifying questions if need be. A semi-structured interview has a prescribed set of questions, but the interviewer is free to ask them in any order and can ask further questions in response to pertinent answers. One opposite point in using interviews is that the interviewer must have developed a rapport with the interviewee (Bryman 2008). I waited until about three weeks into the enquiry to conduct any interviews. This way my rapport with the children was firmly established and our routine of discussing books in a non- evaluative manner was well-developed.

I interviewed each student once on his/her own during the course of the enquiry. I created a form to delve more deeply into each student's thoughts, feelings, frustrations and triumphs surrounding reading in our small group. The students who read Kindle books were asked a few more questions regarding their opinions of e-books. Each student was offered a chance to share his/her opinions with me. In my role as a practitioner, I often have these valuable one-on-one conversations with students on the fly; walking a child back to his/her classroom, or perhaps when we are waiting for others to join our group. These interviews were a little more contrived- I waited until a day when I had a

small window of time and pulled the child to our reading table to read with me independently, then guided him/her through the interview. I recorded the interviews by taking notes on the form. Each interview took about fifteen to twenty minutes to complete, and I tried to encourage each child to speak freely as though it were merely a conversation. It is typical in our school that a child might read with a reading specialist in a one on one setting; for evaluation purposes, to model a lesson, or because s/he needs extra support. In this way, the interviews were not unusual for the children. These semi-structured interviews felt like a logical extension of the comprehension conversations I have with my students on a daily basis, where I am a facilitator of discussion. They yielded good insight into the students' perspectives on reading, both in paper and electronically.

5.5.a Analysis of interviews

As with other forms of data during this enquiry, I did not delve into data analysis for the interviews until I had finished teaching the students for the year. I gave each one a cursory glance as it came in, mostly to ensure there were no parent questions or feedback I needed to answer as a practitioner, which there were not. Then, I set them aside to tackle the analysis at a later date.

In this enquiry, I interviewed each child in a one-on-one setting. I used the same set of questions to guide the conversation, as is protocol in a *structured* interview. However, I allowed the student to drive the conversation and did deviate somewhat from the list of prescribed questions, which resulted in a *semi*-structured interview, also known as a qualitative interview (Bryman 2008). My aim in these interviews was to obtain as much rich personal detail as possible, not to generate answers that could be coded quickly. Also, sometimes the set questions were answered in a different order as the student responses dictated. Again, the constructivist beliefs underlying the research invited this style of research method; teacher prompting to encourage students to dig for deep meaning is a crucial piece of my teaching and lends itself naturally to a semi-structured interview. I also interviewed the parents by using a written questionnaire, incorporating a similar set of questions to those I used with the students. For practical purposes, the flexible nature of the qualitative interview lent itself to data collection, as parents in this setting might have been unable or unwilling to come in and engage in a formal interview in person during the school day. Also, my aim here was to elicit a deeper understanding of their children and reading habits and progress and encouraging parents to write naturally and freely about their child results in far richer data.

Again, I used thematic analysis and narrative analysis to help make sense of the detailed data yielded from both of these measures. I took notes and highlighted terms and themes that came up in the interviews, then coded them according to the themes I had previously identified. I found the flexible nature of coding and analysis both suited my teaching style and allowed me to see data patterns emerge organically (Clarke and Braun, 2016). I also appreciated the one-on-one time with each student to delve more deeply into his/her reading journey. As with the other forms of data, I did keep the BAS results in my mind while analysing these themes, and if certain students had come out as producers of rich data from previous analysis, I paid close attention to their interview.

5.6 Qualitative Data: Self-completion questionnaire for families

I chose to use an open ended, self-completion questionnaire for the families of the students in the study. See Appendix G for a sample completed questionnaire. I wrote it in simple language, attempting to remove any bias from the questions. Holbrook (2017) suggests that it is crucial for researchers to create surveys using clear, basic language that is user-friendly for all respondents, and avoiding agree/disagree or scale response questions. I sent each child home with a copy of the questionnaire and gave specific instructions to have a person at home complete it and return it to me. I am careful to say 'families' here, because although I intended it to be for the parents/guardians, some children told me that an older sibling, aunt or uncle had completed the questionnaire. Many of the students in the study do not live with their parents, so I am mindful of that and wanted to encourage participation in the study, so I did not eliminate any responses.

I chose this method due to its natural fit in a school setting. It is commonplace for students to receive notices or forms sent home with homework, and to be expected to have their families complete them and return them to school. Children and families are accustomed to this sort of task, and I wanted to keep the research as close to a typical setting as possible. The other advantage of a questionnaire is that it limits interviewer effects and allows families to take their time to fill in the survey in a comfortable environment (Bryman 2008; Holbrook, 2017). I know that many of the families of my students do not feel comfortable coming to school, sometimes due to their own poor experiences with school, their embarrassment about lack of English skills, or their socioeconomic status. Also, some parents of schoolchildren feel that a teacher is an authority figure and want to give the teacher the 'correct' answer at all times. I hoped that by eliminating my physical presence in the questionnaire, I would mitigate some of this pressure for families, and they would be free to answer questions in a more removed fashion.

One drawback of questionnaires that Bryman (2008) suggests is that respondents with limited English proficiency will not be able to answer. In my view, this is a somewhat naïve obstacle, easily overcome by translating the questionnaire into the language of the recipient. As a public school in an area where many families do not speak fluent English, we are required to translate any communications (both written and oral) that go home with students. It was automatic practice for me to have my questionnaire translated into Spanish for my students' families and to encourage the children to have their families respond in whichever language they prefer. For further discussion of eliminating bias, please see section 4.10. In planning, although I used clear and basic language in my questions, I did not take into account that some families do not have a literate adult in their home. Children were very honest about why they were unable to return the questionnaire; some student told me it was because there are no adults who read at home. In order to limit bias, I made phone calls to these families to ask the questions verbally, using a translator as necessary. This worked with one family, and I was able to record her answers, but the other non-respondents did not have a working telephone. This is, unfortunately, typical of Z Elementary's students.

A weakness of this type of data collection is lower response rate and potential risk of bias. I acknowledge that the more literate and involved families were more likely to complete the questionnaire, therefore resulting in the potential for skewed responses (Bryman, 2008; Holbrook, 2017).

5.6.a Analysis of questionnaires

As with the other qualitative data, I collected the questionnaires, and did not give them more than a cursory glance upon collection. After I had coded much of the rest of the data, I began to analyse these forms. While they did not yield as much helpful information and I think they might have in other settings with, perhaps, more literate parents, I was able to code the data in the same way- notes, then colour coding the themes, then sorting the papers into piles. These piles became increasingly bigger with the addition of each type of data. It was important for me to visually gauge how much data I had that had been coded to each theme before proceeding with more in-depth analysis. As the questionnaires did not appear to produce rich findings, as compared to the other types of qualitative data, I chose to analyse them last. For some students and themes, I was able to glean supportive data from these questionnaires, and in that respect, this data did fit into the cyclical process by which I analysed the data. I returned to these questionnaires often to see if they provided deeper insight into certain students. Please consider the following example to more closely understand how I did this.

5.7 Iterative analysis: an example

In order to fully demonstrate the iterative nature of this data analysis, I will offer an example. Consider Sean, whose dramatic progress is outlined in further depth in section 6.8.b. I administered the BAS to Sean at the beginning and the end of the enquiry. Based on what I knew from instruction, and his daily interactions with the text and the group, I was not surprised that he made progress on the BAS, but to have made twenty months' growth in three months' time was impressive and unusual. After analysis of the BAS I created a table with the BAS results for each student. I highlighted Sean's name as a student to pay close attention to in further analysis of qualitative data. Then, I set out to analyse the field notes. In searching for themes, I was also looking for anything unusual. I noticed that on most field notes, I had written that Sean chose to listen to text-to-speech. I also noted his reading fluency, as indicated by the running records. When analysing the video segments, I took careful note of Sean's fluency and expression. I was interested to see if there were dramatic differences between Sean and his peers and noted the data accordingly. When it came time to analyse the interviews and questionnaires, I made a note to check his to see if there was deeper information about his experience with e-books or reading behaviors at home.

This example offers the reader some insight into the research process. Many times, the data analysis was somewhat cyclical: I took the BAS data, used it to identify unusual students, then identified themes from the data, and then returned to those students to see if they fell into the themes or if they were outliers. I then examined the other forms of qualitative data in closer depth to see if that data offered anything further. This iterative process allowed me to have deep understanding of the students' progress and develop clear themes that will require further research in due course.

5.8 Trustworthiness, credibility, reliability, validity and conformability

During the study, I have triangulated the data by cross-referencing my notes and interviews. Using multiple measures to evaluate student comprehension (field notes, video recordings and discourse analysis, student interviews, family questionnaires and the BAS) provides a reasonable level of triangulation to the study.

Use of a widely accepted quantitative measure lends confirmability to the study. The students were assessed at the beginning and the end of the study using the BAS. The same test administrator assessed each child both times, in order to minimise subjectivity and maximise objectivity and validity of the assessment.

I recorded multiple lessons in order to get a reasonable sampling of conversation and to further ensure reliability. At least once per week I videotaped each lesson, so that I

had a large volume of data to analyse and also to create an environment where students were comfortable with the video recording. The small sample size is due to the exploratory nature of the enquiry. My primary objective was to determine if, on a small scale, there was any impact of type of text on student comprehension. This study could be replicated on a larger scale using similar methods.

Chapter 6

FINDINGS AND ANALYSIS

6.1 Introduction

One question posed at the outset of this research was, *'Should we consider a new perspective on the definition of 'reading'?* After analysing a variety of types of data, both qualitative and quantitative, I can say with confidence that more research must be done in this area, but arguably, it would behoove teachers and researchers to consider expanding their definition of reading to include e-books and the supports this technology offers. With careful and deliberate instruction, it seems that reading e-books can be considered a similar but not identical activity to reading paper text. In the following section, I will unpack the data I collected and the results I found and discuss how these results support the idea that print *versus* electronic books is an overly simplistic dichotomy.

The literature to date has been inconclusive, and my study did not offer particular further clarity. It seems, from the data I collected, that the type of text used in small group reading instruction does not significantly impact student reading comprehension, but it is possible there are some other areas that must be considered.

In the upcoming section, I will detail the results of the measurements on the quantitative piece of this mixed-methods study. The quantitative measure I used was the BAS, and students were evaluated before I began instruction and at the end of our time working together. It is important to note here that the BAS is merely one measure of student progress, and I was only instructing the students for approximately twenty minutes each day. It is impossible and irresponsible to make generalizations about student progress based on one measurement. The findings primarily serve as data points for use in examining larger trends.

6.2 Does the use of electronic texts as the basis for small group reading instruction in 9–11-year-old students impact student reading comprehension, as measured by the Fountas and Pinnell BAS and discourse analysis?

When discussing my research with colleagues, nearly every teacher's first question was "Which group showed more growth?" That question, while arguably well-deserving of an answer, requires in-depth consideration. See Figure 6 and Figure 7 to examine the student data. These figures show the months of progress each student made, as indicated by the quantitative assessment (BAS). Students are identified by their pseudonyms. At the most basic level, when we consider the mean months' progress for

each group, we find that the paper group made an average gain of 5.79 months of progress during the three-month period of instruction. The Kindle group made an average gain of 5.07 months of progress during the three-month period of instruction. If we assume linear growth for the school year, the paper group would make an extra 2.16 months of growth beyond the Kindle group. But *can* we assume that most students really make linear growth?

FIGURE 6: Table of data illustrating student progress, in months of growth, for students using paper books or Kindle books to read leveled texts in small group sessions, as measured by the Fountas and Pinnell Benchmark Assessment System.

Data Showing Student Progress

Paper Group		Kindle Group	
Student	Months of growth on B A S	Student	Months of growth on B A S
Scott	<i>m oved</i>	Maureen	0
Aine	0	Alanna	3
Mary	3	Joyce	3
Quinn	6	Sinead	3
Daniel	9	Patrick*	6
Seamus	<i>m oved</i>	Jane*	6
Conor	18	Declan	3
Shane	3	Brian*	6
Cait	12	Niall*	3
Biddy	6	Ian	6
Fintan	0	Nora*	9
Ciara	3	Sean*	20
Brendan	6	Thomas	0
Grainne	6	James	3
Ryan	3		
Walter	3		

*Chose to listen to text-to-speech most days

According to Fuchs and Fuchs, “... for most students, reading and math progress made during one academic year can be characterized as increasing in linear fashion with time.... [and] The progress occurs additively within the framework of a single academic year.” (1993 p. 15). Their findings support the idea that if my students had remained in their groups from September to June, a typical school year in the region of North America where this study was conducted, the paper group would have made just over two months’ extra gain in comparison to the Kindle group. While two months of progress in this setting is not necessarily statistically significant, in a practical setting, it could have the potential to counterbalance the summer slide that teachers argue that many students

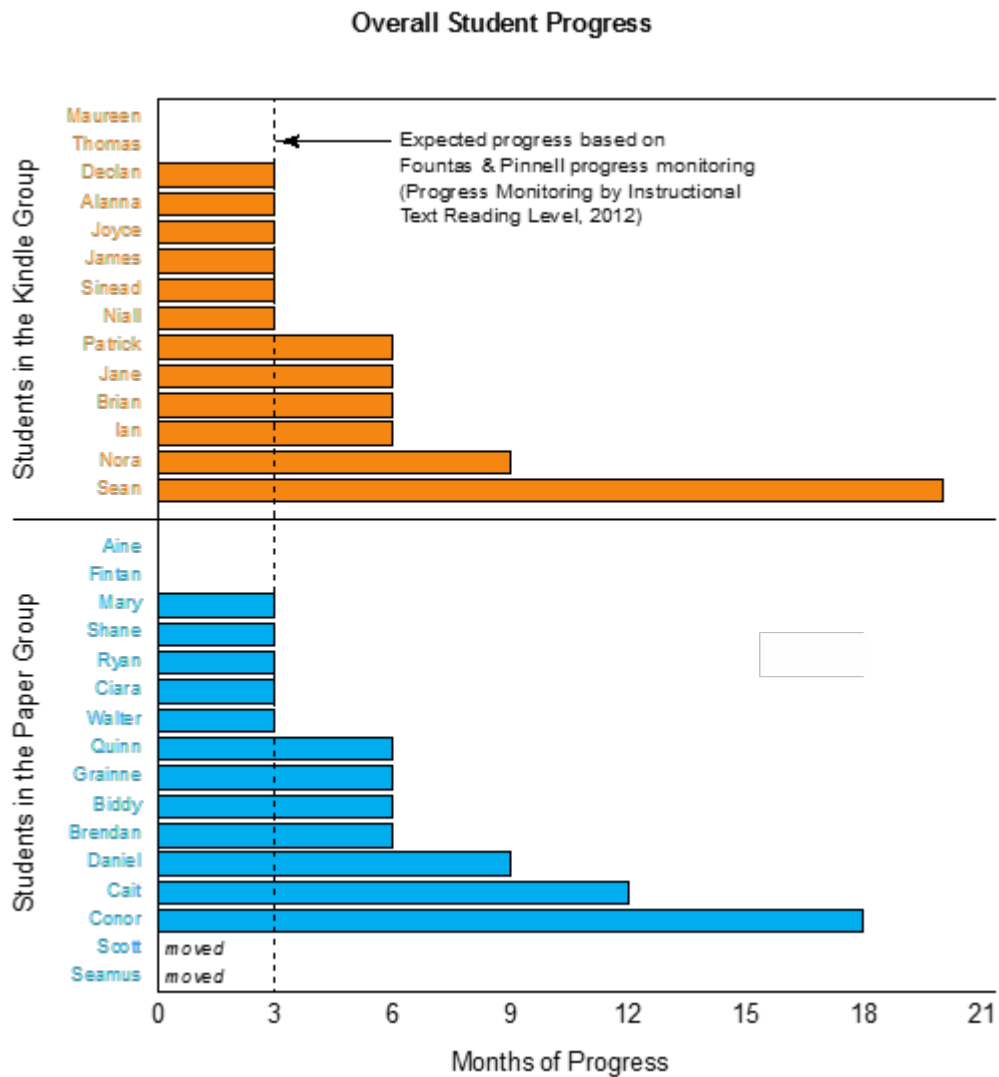
experience. It also might be significant in terms of ensuring that a child is ready for state and local standardised testing or makes progress in meeting state-determined curricular benchmarks. Given the data, if we were to assume linear growth year after year, the students reading paper books could make an extra 10.8 months of growth over the course of primary school, which is more than one school year's worth of extra growth. To many teachers, the idea that students who use Kindles to read would be nearly a year behind their peers would be cause for great alarm. This assumption would be rash and likely inaccurate. However, we may not need to be concerned about a cumulative effect over the course of the students' primary school experience. Consider the research of Fuchs and Fuchs, who stated that "Although a linear relationship adequately modeled reading and math growth within an academic year, a linear relationship did not adequately model academic growth across years in school." (1993 p. 16). It may be worth consideration in a longer and larger-scale study to examine the longer-term effects of text type on comprehension and see the impacts of technology over the course of a child's primary school career.

I have included a bar chart [Figure 7] showing student progress, to demonstrate the data in a visual fashion. When we examine Figure 6 and Figure 7, we can see that overall, the two groups demonstrated very similar performance in terms of text level gains. This comparable progress between the two groups, with the paper group demonstrating a slight advantage, is similar to the findings of Reich et.al, (2019) in their study of preschoolers. Two students in each of my groups did not exhibit progress on the BAS, and each group had an outlier who made more than a year's worth of growth in three months of instruction. Each gender was mostly equally represented in each group, and there was no notable difference in performance of boys and girls.

It can be argued that the group of students who read e-books made slightly more consistent progress than those who read paper books. The paper book group had two students who made significant progress and the Kindle group had one. In a similar vein, the paper group had seven students total who made more than expected progress, and the Kindle group had six. The quantitative data shows that most children, regardless of the type of text used for instruction, made at least expected progress in reading, if not better than expected. My findings were largely in keeping with current research (Chang and Millett, 2015; Grimshaw et al. 2007; Wood et al. 2017; Karemaker et al., 2017; Mangen, Olivier and Velay, 2019) that reflects either a positive or nonexistent impact of text type on reading comprehension. Much of the research that has been done has had mixed results, possibly due to a variety of variables in the studies.

In upcoming sections, I will delve into the qualitative data and examine student progress and trends more closely.

FIGURE 7: Horizontal bar graph illustrating student growth for both the Kindle device group, identified in orange, and the paper book group, identified in blue. The vertical hyphenated line illustrates expected growth for all students based on the duration of the study, regardless of text type.



In the upcoming sections, I will use a combination of the quantitative data and the qualitative data I collected to attempt to evaluate the impact of text type on reading comprehension in primary school students. I set out to answer in this question with a small-scale, mixed-methods enquiry, conducted in my own school setting within the scope of my typical job as a reading specialist. During the time of instruction, I collected qualitative data in the form of video recordings, field notes, semi-structured interviews, and self-completion questionnaires. I analysed this data using discourse analysis and

thematic analysis. In this section, I will use the data to evaluate some of the questions I set out to explore. Each section begins with a claim, which is followed by data from my study that supports it. In some sections, I felt it necessary to include an outlier- a student who demonstrated different performance or unusual data.

6.3 The text-to-speech tool can be a beneficial support for comprehension.

As examined in section 2.5, rapid changes in technology may be impacting reading and reading comprehension. One theme that emerged from this research is that text-to-speech and its use in reading bears closer examination. This theme is echoed in current research (Grunér, Östberg and Hedenius, 2017; Young et al., 2018; Košak-Babuder et al., 2018) and supported by my findings, as detailed in the following section.

During the guided reading lessons, I allowed the children to bring headphones and to avail themselves of the option of text-to-speech that is offered on the Kindle devices. Some children chose this option once or twice, and then the novelty wore off and they preferred to just read without listening. Patrick, Nora, Sean, Niall and Brian chose to use their headphones most days, as I noted in my field notes, and they liked to take advantage of the text-to-speech tool on their Kindle devices. When children were using the audio feature, I had them listen and read along silently during the time they would normally be reading silently. When it was time to read aloud to me, which is a key portion of every guided reading lesson so the teacher can check on accuracy, fluency, and speed, they would remove the headphones and pick up reading aloud. When I moved on to the next student, they would replace the headphones and resume listening while reading. I did note in my field notes that some children were more easily able to slide in and out of audio and oral reading than others, but overall, most of the children who chose this support were competent at transitioning between listening and oral reading.

Brian was the member of the Kindle group who most frequently chose to listen to the book via text-to speech. He quickly demonstrated a level of comfort with enabling the text-to-speech function, and most days he would listen until it was time for him to read aloud, and then he would slide his headphones off his ears and put them around his neck, read aloud until I moved on to the next child, and then slip the headphones back on his ears. The transition was seamless for him. As measured by the BAS, over the course of the three months of instruction during the study, Brian made six months progress in reading comprehension.

We can see evidence of Brian's understanding of the text as follows. I (the teacher) was looking for the students to identify a character trait of Harriet Tubman and support their claim with evidence from the text.

Teacher: “How do I know, Brian, that she’s strong? Tell me from the text, what does she do that’s strong?”

Brian: “In chapter 1, she um one person escaped and the seer⁴ was following the person and then she followed um the seer and then and then she was brave enough to go in front of the seer.”

Teacher: “Ok, I heard you say a really good quality in there, what was the quality I heard you say?”

Brian “Brave.”

In this short extract, we can see that Brian was able to identify a character trait and support it with evidence from the text, thereby achieving the lesson objective. It is important to note here, that Brian’s oral language was not necessarily fluent, and his speech patterns consistently included a lot of fillers. One might also wonder if his use of the word “seer” instead of “overseer” was a result of listening the text as opposed to reading it. In print, we might assume, based on his reading level and demonstrated, that he would have recognized the word ‘over’ in the first part of ‘overseer’ although he might not know the unfamiliar vocabulary word ‘overseer.’ Grounded in my training as a reading specialist and my experience as a literacy teacher, I concluded that the use of the word ‘seer’ (pronounced see-er) to describe a supervisor (one who sees things that are happening) was an acceptable substitution, as it did not impact his understanding of the text. Despite his vocabulary error, which did not appear to impede comprehension in this case, he was able to identify a very clear and important trait of Harriet Tubman, which was the objective of the lesson. It can also be argued that by listening to the text, an option offered to him through the use of an e-book, Brian was able to gain meaning and lift his levels of understanding despite an unknown vocabulary word. This example leads us to consider that more research might be needed to determine the types of substitutions that readers make when they are listening to books in audio format as opposed to reading them in visual format. Although different type of errors in reading digital text and paper text was not the focus of this small-scale inquiry, it may be worth exploring in future research.

Patrick, a student who also made twice the expected progress on the BAS, was a frequent user of text-to-speech support. Consider this extract where we can see Patrick displaying solid evidence of strong reading comprehension.

MM “The author is suggesting that Stone Fox does not have a kind face when he looks at a young person. He looks at them with a serious face.”

Patrick "...especially someone who's white.

MM "Especially someone that's white. Talk a little bit about that."

Patrick "Um that his tribe... hadda move from Utah to Utah to Wyoming because white people were taking over their land."

MM "Tell me why Stone Fox wants to win?"

Patrick "So he could buy the land."

MM "So he can buy the land back."

Jane "Did you read it somewhere before?"

MM "The United States government took the land... no it's written in there."

Declan "Wait. Stone Fox is... not white?"

MM "Stone Fox is an Indian... Native American"

Jane "With dark skin."

Declan "Oh."

MM "And in the... United States, we did take, well not me, but the United States government, took the land away from the Native Americans and so and made them go and live with other tribes that were not their own tribe and that was very difficult. And Stone Fox is trying to win all these races so he can..."

Declan "Take it back."

MM "He wants to buy his land back. Does anyone notice a similarity there?"

Jane "Yes..."

MM "Can you talk about that?"

Patrick "Doesn't Little Willy... like the um... that little willy and the stone fox are trying to help the people.

MM "Both trying to help who...?"

Jane "The people?"

Patrick "Stone Fox is trying to help his tribe...Little Willy is trying to help his grandfather."

Patrick is able to use the evidence in the text to support his answer and make some strong inferences about character motivation. Despite his classmates' diversions, Patrick stays focused through the conversation and is able to convey his point clearly.

Jane, a student in the Kindle group who made six months' progress during the course of the study, chose to listen to the text most times. She expressed a strong preference for an e-book for a variety of reasons. She was another student who felt that the advantage of the Kindle was the ability to manipulate the font. She said "I think a Kindle is easier, in a paper book the pictures... well... on a Kindle you can tap the picture to see it bigger. It's also easier because on a Kindle if you like you can use the

voice to listen, it's an option.” It is interesting that in my field notes I did not note much evidence of Jane manipulating the font in order to make things bigger, but she did seem comfortable with that tool. I did note that she chose to take advantage of text-to-speech quite often, and she was adept at the quick transition between headphones and reading aloud. It is interesting to note that she did mention previous experience listening to an e-book. During her semi-structured interview, she said that when she was younger, her father got her a Kindle and she liked that it read to her. In her family questionnaire, her parent said that she reads a Kindle at home and that they own a tablet and a laptop. Jane's obvious skill level with the technology and ability to use its tools to her advantage were an asset in her learning. It appears that listening to the text was a familiar and comfortable support for Jane, and she was able to make use of this tool in order to enhance her reading comprehension skills.

One conclusion we might draw from this data is that listening to a portion of the text as an audio book does not negatively impact comprehension. In fact, we might be able to argue that using the text-to-speech tool actually improves comprehension for most students. This finding is similar to the findings of Grunér, Östberg and Hedenius (2017), who found that students in grades 3-5 increased their reading comprehension whilst using text-to-speech. Young et al., 2018 examined the impact of text-to-speech on older students (ninth graders), and their findings indicate similar results. In fact, they assert that the use of such technological supports can be considered “...a win-win for instructors and learners.” (Young et al., 2018, p. 90). Košak-Babuder et al. (2018) considered the impact of text-to-speech on student performance among a group of students who were English language learners diagnosed with dyslexia. This research indicated a lack of difference between the listening-only and reading-only groups but did not include a group where students were both listening and reading. It is interesting to note that Košak-Babuder et al. (2018) found no significant difference between the two groups, but only chose to use informational text. It bears future examination to more closely examine genre as well as text type. It is also worth noting that these researchers were examining students with diagnosed disabilities and my research did not differentiate among students with or without such challenges. We can see that the trend towards possible improved reading comprehension, whilst using text to speech support is grounded in the current literature as well as my findings.

When examining the data produced from the BAS, we can see that every child who chose to use the text-to-speech tool as a supplement to visually decoding the text made *at least* expected progress over the course of the intervention, and the strongest performers consistently chose to make use of this support. It seems that listening to text-

to-speech whilst reading along on the screen complements reading development. Quite possibly this is the element that was lacking from the research of Košak-Babuder et al. (2018), which resulted in such similar outcomes for their two groups. Kindle devices offer a variety of tools designed to enhance reading performance. Text-to-speech appears to be a tool that did not have any negative impact on comprehension. In fact, the benefits to comprehension might be considered transferable skills- the students were evaluated using a traditional paper text for the BAS and still made significant gains. This might suggest that students who were liberated from much of the challenge of decoding were able to use higher order thinking skills to enrich their comprehension. The students were following along on the screen whilst listening, so it seems that the transferable benefits of text-to-speech tools might be worth examining in future studies. It is possible that as students were gaining skills in comprehension, they also built competency in decoding accuracy, despite less direct practice with the skill, as indicated by their progress on the BAS, where they were evaluated for decoding accuracy as well as comprehension. The potential benefits of the transferability of skill bear future close examination.

In the next section, I will examine another feature unique to e-books, which is the visual presentation of text. I will also discuss the options available to students for manipulation of text appearance. This tool may not have the same impact on comprehension as text-to-speech does; in fact, it may at times cause discomfort or distraction for students.

6.4 Variable text appearance impacts primary school students in small group settings.

There exists a great variation in the way books are formatted for the Kindle, and this in turn may impact how they are read or understood. At the time of this writing, there is little literature examining this variation. It is this discrepancy that bears further examination and is supported by my findings.

In the course of my small-scale study, while it was not possible to fully consider the question of varied Kindle appearance, I did identify some exploratory trends. In my field notes, I noted that some Kindle books appear to be just scanned copies of the book, similar to a PDF. Some are blurrier than others, and illustrations are not as detailed or rich as they are in print. Tables and charts appear in a tiny font, nearly illegible, and the reader cannot zoom in or change the size. Other e-books, however, appear as though they have been reformatted with Kindle in mind. In these books, the reader can alter the font size and type, zoom in on illustrations and tables. When choosing the books for instruction, I focused on reading level, availability (both on Kindle and in multiple copy

in our school or for purchase) and alignment with the curriculum. I did not anticipate that there would be such variation in Kindle format, and this could be considered a design flaw in my study. However, I contend that it is an emergent result of my study, which is why I chose to discuss here as well as in the limitations section. While I did not anticipate this being a point to consider, over the course of my research I identified the format of the Kindle books to be significant, and to have potential impacts on my results. A very recent study by Mangen, Olivier and Velay (2019) appears to have considered the same challenges of e-books. Mangen, Olivier and Velay (2019 p. 4) were careful in their research design to select only Kindle books that had the same visual presentation. It appears that this limitation of my small-scale study, further discussed in section 7.4.b, has been identified and addressed by some researchers in the time since I completed this research.

Several students commented on the appearance of the e-text. Thomas commented that reading on the Kindle was easier than paper text because it offered him a bigger font. He also said the tools he liked were the ability to change the font, the colour and the background colour. He commented that, “I like the green [background] because it makes the black words pop out more for me.” I observed in my field notes that many children chose the green background when they were reading. I also noted that changing the font and colour was the tool that many students in the Kindle group chose to use more regularly than others, like text-to-speech. Sean, a student in the Kindle group who achieved twenty months’ progress in the three months I worked with him, commented that he likes to read a Kindle better because “You can change the settings to the light you want...when it’s bright on white it hurts my eyes so I like to read [white print] on black because it is not so bright.” James, who made the expected three months of growth on the BAS, said that he prefers an e-book because the words are bigger. Quite possibly he means that he can *make* them bigger.

Consider the following extract from a lesson with James. We were reading *The Moon* by Seymour Simon, which is an elaborately illustrated picture book that in Kindle form, seems to be just a scanned copy with very small font and even smaller pictures, and does not allow the reader to manipulate of the font or size.

James: “Wait isn’t that... there’s two moons. Cause look, see there’s another moon that we can see.”

M.Marino shows her own book, which is a paper copy.

M.Marino: “That’s the sun that we can see in that picture”

Students: “Let me see!” and reach for paper text, abandoning the Kindle devices.

We can see here that James is incorrectly inferring from the picture that there are two moons. We might wonder if, had he been looking at the paper text or been able to resize the illustration, if he would have made the same mistake. While that is impossible to know, we can see here that the children- and the teacher- prefer the paper copy.

In analysing this segment of data, I recognised that I should probably have avoided taking out a copy of the paper book at all, as it seems to lure the children away from the Kindle. This is another illustration of a time where a teacher who is more at ease using purely digital devices might have been less likely to show the students the actual paper copy. As a teacher, I found that I did all of my preparation and planning using the paper copy, and only used the Kindle book when I was working with the Kindle students. Another area to examine in the future might be the text type the teacher uses in planning and teaching the lessons, and if that has any impact at all on comprehension. It might be worthwhile to study teachers on all ends of Prensky’s (2001) ‘digital native’ spectrum. In this case, we can see two factors that negatively impact student comprehension. First, the lack of clarity in the illustrations resulted in confusion for the student. If he had not brought it up in the discussion, he may have carried on thinking, incorrectly, that we have two moons orbiting our planet. This interaction is cause to wonder what other confusions students had whilst reading in small group that have not been cleared up. Secondly, the fact that the teacher used the paper copy of the book, where the illustrations are clear and striking, to offer the necessary clarification for students to understand the text. This interaction underscored the difference between the Kindle version and the printed version. Reflecting on this conversation with James led me to believe that there is much more research to be done in the area of teacher text preference and level of comfort with Kindle devices, and the impacts on instruction.

In analysing the field notes from this enquiry, I noted a good deal of student behaviours that led me to believe that the Kindle was challenging visually. This was not limited to the scanned-in books but appeared more prevalent in those books than in the books which had been specifically formatted for electronic reading. For example, many students peered closely at the Kindle devices while reading. These children often put their nose nearly on the Kindle in an (seemingly inefficient) attempt to make the words appear clear, or to successfully decode. I also noted that many students had a good deal of trouble navigating the sidebars and charts. In contrast to the paper book readers, the Kindle students were often unable to successfully extrapolate meaning from charts and

tables, and I argue that this was because they were more difficult to see. In addition, the tables, charts, and illustrations often appeared at different points in the text than in the paper books, so sometimes the value they added to the text was lost. Often when reading the Kindle, students just skipped the table or chart and did not read the captions. A large part of my explicit instruction was about using text features, so it surprised me when children did not choose to use them or refer to them in group discussion. It is important to note that I did note these behaviours across all my Kindle groups, regardless of the way the book was presented electronically, but students were more apt to complain about text size or lack of clarity on the books that seemed to be just a scanned copy.

In this instance, it can be argued that improved technology might mitigate this challenge and allow students the same level of Kindle access on all books. For example, in print books, publishers follow well-established conventions such as placing diagrams on the same page as relevant text. At present, some Kindle books do not follow this format and it presents as a hurdle to comprehension. Consistent and clear formatting would ease this challenge for the reader. Mangen, Olivier and Velay (2019) also note that another challenge for readers of e-text is difficulty in locating information on previous pages. They suggest that perhaps a "... sense of added cognitive (and sensorimotor) effort discourages readers from going back to re-read earlier parts..." (2019 p. 8) thus impacting comprehension. In future research, it might be worth further examination to determine if this difference in visual appearance and function impacts comprehension.

6.5 Student oral language impacts comprehension, regardless of text type.

The importance placed on the role of oral language during this enquiry was echoed across the findings. As indicated by current literature (Peterson, 2017; Boardman, Boelé and Klingner, 2017; Morocco and Hindin, 2002; Skidmore, Perez-Parent, and Arnfiel, 2003) and largely discussed in section 2.4, this research was grounded in the belief that oral language and its role in student comprehension of text setting bears close examination. This belief was supported by the findings and will be discussed in the upcoming section.

Grounded in LaBerge and Samuels (1974)'s work and echoed in more recent research (Fuchs et.al. 2001, Chang and Millett 2015, and Groen, Veenendaal and Verhoeven, 2018), it appears that fluent readers exhibit more automaticity at the task of reading, and therefore are more able to implement processing strategies to increase their comprehension of the text. My findings support the work of these researchers. Please consider the following example.

Shane, a member of the paper books group, made the expected three months' progress during the enquiry. Consider the following sample of a book discussion.

Shane "... Um I found out the cotton was used for clothing. Um the cotton plant was used for um for um clothing and without the cotton plant um you um there wouldn't be clothes. Clothes. And they needed those lifes to pink them."

Cait: "Are you done talking... What was I gonna say?"

It appears from this short extract that Shane's disfluent speech was making it difficult for Cait to contribute to the conversation. She was not even sure when he finished his statement. We can see that he was in command of very literal comprehension of the text, as it seems he has understood that the cotton plant was used to make clothing, which is an important product. It was unclear – to both his classmate and to the teacher – what he meant by his last sentence. We can see that Shane repeatedly used filler words in his spoken speech.

In examining the field notes, I noted the same disfluent speech pattern appeared for Shane on an almost daily basis. Shane often did not usually finish reading the chapter at the same time as the rest of the group due to his extremely slow silent reading pace. His oral reading included a good deal of filler words and repetitions. It might be argued that his slow silent reading is because he was doing the same things while reading silently as he was whilst reading aloud. As he was usually struggling to catch up to the group in reading, he was often late to the discussion piece of the lesson, which further impacted his comprehension. Shane would have benefitted from some individual instruction in improving pace and fluency, which arguably would have positively impacted his reading comprehension. As Shane was a member of the paper book group, we cannot say what, if any, impact the Kindle might have had on fluency and therefore, comprehension. It is possible that being allowed to listen to the text-to-speech might have been a helpful support for him. Based on the BAS data, Shane did not make accelerated progress, and arguably, one major factor in his relative lack of progress was the absence of fluency in his reading.

We see further evidence of dysfluent speech impacting conversation in this extract. The children and teacher were discussing Jackie Robinson, and the teacher was attempting to have the children consider character traits as evidenced by Jackie's actions.

James "I think he's a good person by defending his team."

MM" Ok... talk about that."

James "Well but like he um talked to the m-m-mman at the gas station when he didn't let them leave the bathroom. He said he wouldn't pay he wouldn't pay wouldn't pay it for the gas."

MM “Why? Why did he do that?”
James “Cause the he didn’t let him use the them use the bathroom!”
MM “But what was the bigger thing that Jackie was thinking about there?”
Kids “mmmm...”
MM “Was he thinking really about only that one bathroom?”
Students shake their heads.
Sean “No.”
Thomas “About his team...”
Sean “They all had to use the bathroom?”
MM “What were some of the other challenges with the Negro team? What were some of the other problems that they had as a baseball team?”
Thomas “They couldn’t practice.”
MM “They didn’t have extra practice.”
James “But they couldn’t sleep in hotels.”
MM “Why not?”
James “Because cause only white people could.”
MM “There were no hotels for black people. How do you think that makes the Negro team feel?”
James “Sad.”
MM “Terrible!”
Sean “Because they have to sleep on their bus.” [glances at Kindle, as if to confirm]
MM “Or where else...”
James “I mean, the bus... is nice.”
MM “Jackie stood up for his team. What is that character trait, starts with a b?”
Thomas “Brave.”

We can see here that the discussion is stilted, and the teacher has to reframe the thinking for the students. James seems to struggle with language fluency, and therefore he struggles to infer anything meaningful from the text. While he begins the conversation with a reasonable statement, when he begins to suggest that the bus might be a nice place to sleep, it seems he has missed the entire point of the discussion. This is likely rooted in his lack of command of spoken English fluency, which is impacting his comprehension of the text. The teacher attempts to refocus the group here, and with prompting and hints, Thomas is able to respond accurately. In keeping with the research (LaBerge and Samuels, 1974; Fuchs et.al. 2001; Chang and Millett 2015; Groen,

Veenendaal and Verhoeven, 2018), fluent reading is essential in order to allow students the cognitive flexibility to make inferences about the text. Thomas is demonstrating that his lack of fluency in English impacts his reading comprehension.

In contrast, examine Cait, who used her strong understanding of vocabulary to overcome her lack of fluency in reading. Consider the following segment.

Cait: “Harriet was praying for one of I think one of the bosses to die. So when he got the bosses got sick and died but then another one came and Harriet was sorry cause he didn’t she regret to pray for her boss to die.”

M.Marino: “Great word, regret. What does that tell me about Harriet as a person?”

Cait: “She’s a nice person.”

In this extract, we can see that Cait’s spoken English was not particularly fluent. She was not a native speaker of English, she inserts words where they don’t belong, and has some trouble with verbs. However, these errors did not impact her comprehension. Cait made an impressive full year’s worth of growth on the BAS in just three months of instruction. In this short example, we can see that Cait is capable of identifying a character trait and supporting it with an example from the text. She is also demonstrating use of comparatively advanced vocabulary in one sentence (“regret”) and somewhat more basic vocabulary (“nice person”) just a second later. The inconsistent use of higher-level vocabulary leads me to believe that this is a skill Cait is still mastering, although she is definitely demonstrating some competency. In her family interview, Cait’s family said that she buys a book at every school’s book sale and also reads books on her iPad at home, and Cait herself said, “I bought a book at school and I read it on the bus.” We can argue that her family’s investment in literacy and her clear enjoyment of books positively support Cait’s excellent progress.

Cait’s oral reading was more fluent than her spoken language, and when reading silently, her pace was fast. As she did not have any experience reading Kindles in this enquiry, we cannot know if she would have chosen to use any tools or features to support her reading, nor can we know if the use of tools would have impacted her performance. We can use Cait’s ability to extract meaning from text *despite* some disfluent spoken English as an exemplar. It appears that, at least for this one child, spoken fluency has a smaller impact on comprehension than vocabulary knowledge. To that end, perhaps the use of a dictionary tool in a Kindle book might have offered her even greater support and allowed Cait to make even more progress in the short time we read together.

Nora, a member of the Kindle group who made nine months of progress during the enquiry, demonstrated quiet confidence during the lessons and did not participate much in the group discussion. Consider the following extract.

M.Marino: “Another... kind of main idea in this section was about what it’s like on the moon.”

Sean “Oh YEAH!”

Thomas “Oh! There’s no weather.”

M.Marino: “There’s no weather on the moon. Tell us more about that.”

James: “Wait ...doesn’t it rain on the moon?”

Thomas: “NO! On the first page... it says the moon doesn’t have air, water, clouds, rain or snow.”

James: “No I know that.”

Nora: “If it doesn’t have clouds then it can’t rain.” [pointing at James]

James: “I thought it had I thought it rain!”

M.Marino: “Does anyone else have any other details about what it’s like on the moon?”

Ian “I... I... I...I would like to add to that.”

M.Marino: “Hang on, hang on... you’ve already had a chance to talk today, James is gonna talk and you can add to that.”

James “Umm.... aaaaaaHHH... Ehhhh....Ahaaaaa Emm. There’s no water on the moon?”

Thomas: “I just said that.”

M.Marino: “Ok, so what did you want to share with us about that?”

We can see from this extract that both Thomas and Nora are demonstrating solid comprehension of the text. Thomas provides a specific example from the text. Despite the fact that Thomas did not demonstrate progress on the BAS, he showed here that he was able to support his answer with a very specific example from the text. Nora, in contrast, made significant progress on the BAS. In this segment of a lesson, she may be bringing prior knowledge to the table, but not using text-based evidence to support her claim. While it can be argued that prior knowledge is very important to reading comprehension, I was not exploring its impact in this enquiry. When I interviewed Nora in an independent, semi-structured interview, she told me that she reads only paper books at home, and she only reads a little bit. She also said that reading a Kindle is easier because “... if you can’t see the words you change the font, in a regular book it’s too small and

you can't change it." She said the tool she liked most on the Kindle was changing the font to make it bigger, because it's "... easier when I don't have to go so close to it." She chose to read white letters on a black screen because "It looks easier for me. It's not so light. I don't like it so bright."

Nora was in the group that read *The Moon* by Seymour Simon, among other titles, so she had experienced the Kindle books where she *couldn't* change the font, and yet she still claimed that enlarging the font was the best part of an e-reader. Nora also told me that if she were offered the choice, she would read a paper book (even though she thinks the Kindle is easier to read) because "...say the Kindle ran out of battery, but I could just have the paper book with me at all times." This was a surprisingly practical consideration that no other students mentioned. I kept the Kindle devices fully charged for them and at no time did a Kindle run out of battery, but I imagine she is bringing her own personal background with other technology into this conversation.

Nora seems to be an outlier because, despite reading Kindle books that might have been challenging visually and not demonstrating high levels of comprehension in group discussions, she made accelerated gains on the BAS. Nora's comments about the font *in paper books* being too small were unique, as was her preference for a paper book despite finding a Kindle easier to read. There are many factors that could have contributed to her success, some outside of my control. Perhaps Nora absorbed more from the class discussion than she demonstrated outwardly, and despite my lack of evidence from her discourse, she was able to benefit from the discussions we were having around her. It seems that she found some of the areas her classmates considered challenges of reading on an e-reader not to be challenges at all. One area I was not able to explore within the scope of this study, but bears further examination in due course, is any discrepancy when students are instructed on an e-book but are evaluated using a paper text. I wonder if Nora, in this case, found the print on the BAS to be small and difficult to read, and if she would have performed even better if given an assessment in e-book format. In retrospect, it might have been interesting to ask the children their *assessment* preference as well as their reading preference. However, that may have introduced a variable that would have complicated this small study. In future research, it would be fascinating to look at the match or mismatch when children are instructed using one text type and evaluated in the other.

6.6 Outside involvement may impact reading comprehension.

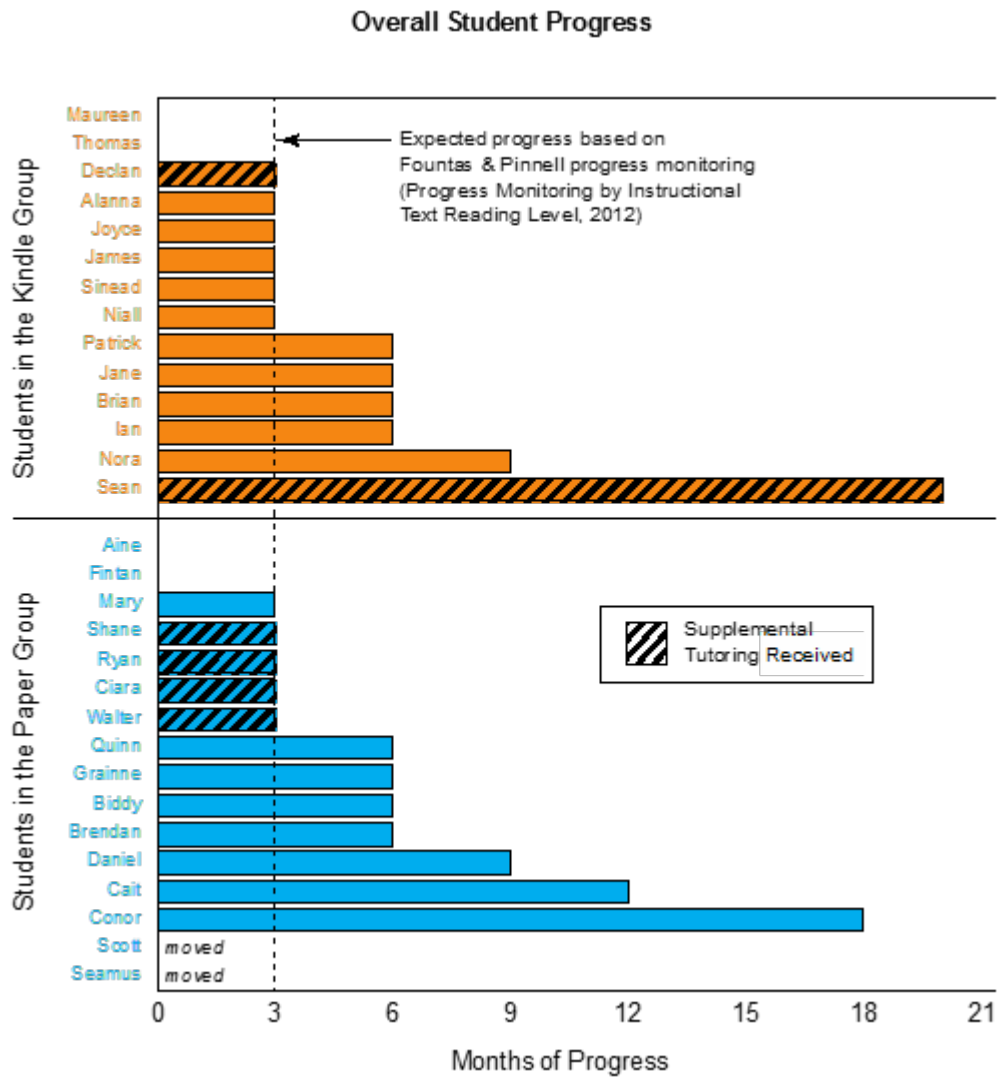
During the course of this small-scale study, I instructed students for 20 minutes each day. During the rest of their day, they were with their class teachers receiving

typical instruction. As mentioned in the limitations section, I could not control for the impact of different class teachers on the students. However, it bears mentioning that there were some outside influences on the students, and they may have impacted the results of the study.

6.6.a Tutoring

An unexpected variable cropped up after I had selected the students for participation in the study. As is the case in action research in a school setting, school leaders can make decisions over which teachers have no control. In this case, about a month into my study, the head of school determined that certain students would be selected, based upon their state testing scores, to receive extra tutoring after school. The students were grouped according to test scores, and they were offered two one-hour sessions per week in general language arts tutoring. They received tutoring from a licensed teacher who works in the school. Activities during the tutoring sessions included reading paper books and responding to open-ended questions about the text, summarize reading short articles, or test-taking strategies. No children were instructed using e-books during the extra tutoring. Many of the students in the tutoring groups missed sessions due to absence or snow days, so the overall number of sessions is lower than what we might have expected for an eight- week course of tutoring. Only seven of the students in my study were selected for this tutoring scheme, and I was relieved that the group was roughly balanced between Kindle and paper book readers. See Figure 8, which identifies the students' progress and if they received the supplemental tutoring or not. Please note that Thomas did not make any progress and was one of the seven children to receive tutoring, but because he made zero months of progress, his bar on the chart is flat, and therefore unable to indicate the tutoring he received.

FIGURE 8: Horizontal bar graph of student progress, similar to Figure 7, highlighting students who participated in additional literacy tutoring during the enquiry period.



When we examine the data from the students who received supplemental tutoring, we can see that only Sean, who is a previously established outlier, made dramatic gains. Thomas, another outlier, did not make any measurable gains in reading over the course of three months despite the supplemental tutoring sessions. The other students made the expected progress over the course of the three months I worked with them. It is possible that without the extra tutoring, they might not have made progress, but I think it can be argued that since they made typical progress as defined by the BAS as a measure, we can assume that the tutoring did not impact their progress during the study. While it is important to note that the students did receive extra instruction beyond

what their peers in the enquiry received, the data displayed here reflects the negligible impact the tutoring scheme had on the students in my study.

6.6.b Home impacts

One limitation of action research in an actual school setting is that we cannot control for outside influences. In the case of this study, I had class teacher and other school influences as well as home influences. Many of these children come from homes where basic needs are hard to meet. Many of the families are highly mobile and constantly shifting in household makeup. While the focus of my study was not parent impact on reading comprehension, I did ask for feedback from the families in order to round out my picture of each child's literacy background. Several parents mentioned that they wished their child would enjoy reading more or acknowledged that they needed to encourage their child to read at home more often. Most families said they got their books from friends, school's book fair, or the library.

Jane's family questionnaire stood out as an outlier. Jane made six months' progress during the three-month study but appears to lack resources to read at home. Her parent said that Jane wants to read more at home, but the family doesn't have a car, and once they do have one, they will be able to get more books. Jane mentioned that she owns both a Kindle and an iPhone. Based on her parents' answers, it seems that this family believes the only way to get a child to read more is to go get physical books somewhere, and at this time it is not possible for them.

It is important to note here that, while this study did not focus on the impact of family involvement and reading at home on comprehension, it may have impacted student outcomes on the BAS. In addition to working with the students about the tools offered by Kindle to enhance reading, in future work it might be worthwhile to consider adding an instructional component for families of students who are using Kindles. Consider Jane's family, who have the technology at home to allow for a good deal of reading, but do not have the ability to drive to a shop or library in order to get books. It might be the case that with a little help, they could set up a free library account and borrow digital books. Possibly, Jane herself could link up her library card with the online digital library and borrow books for her Kindle. It seems, from the conversations I have had with Jane and her family, that their view on Kindle books might be limited, yet they are willing and able to avail themselves of the books and tools offered. When considering the practical implications of technology on literacy or looking to further the work of Gray and Howard (2017), this an important vein to examine.

6.7 How has the use of e-text impacted the lessons in this enquiry?

In analysing the data, I used Puentadura's (2006) SAMR model as an instrument for classifying the different instructional tasks, as outlined in section 2.6 and Figure 2. For example, it seems that when a child was reading a simple scanned copy of a book in a Kindle device, like *The Moon* by Seymour Simon, the student was viewing and reading the book in exactly the same way as his peer was reading the paper version of the book. In this case, we can be reasonably certain the task is just a *substitution*. The Kindle book is taking the place of the paper book with no changes whatsoever to the appearance or function of the text. In another case, when the children chose to alter the appearance of the text by changing the background colour, the print colour, or the font size, it can be argued that they were *augmenting* the original task. This augmentation requires a Kindle book that has been adapted for Kindle and not merely scanned in from a paper copy. As discussed in previous sections, more research might need to be done to delve more deeply into the differences in formatting and publishing. It is also possible that with time and advances in technology, this disparity will cease to exist.

In both the substitution and the augmentation of original task, we can consider the addition of technology to be something that *enhances* the original task. It seemed that the students in the Kindle group were comfortable enhancing their reading. For the most part, with a little practice and some explicit teaching, they were able to manipulate the text size and colour, and most students had a preferred background colour. While I did give them a brief introduction to these tools, I did not offer much in the way of instruction on how to use them. I do know that most students at this school are adept at using Google Classroom for word processing and they do manipulate fonts and colours in their writing assignments. It can be safely assumed that the prior knowledge they brought from their classrooms also helped them to feel comfortable enhancing their learning in this way. However, based on the quantitative data, while the students easily enhanced the tasks, this enhancement did not appear make a significant impact on their learning. If we examine the BAS results, we can see that the students who used the Kindle made just slightly less progress on average than their paper book peers. While this is a small-scale study, and results can only be taken as indicators for future study rather than highly generalizable, it is important to note that the students who made the most progress used the Kindle in more transformative ways.

From the data collected during this small-scale study, it appears that simply handing the child an e-book and asking her to read on it is merely a slight enhancement of the task and has limited positive impact on reading comprehension. If the intention is

to positively impact students' abilities to comprehend text, it appears that more attention must be paid to actually *transforming* the task. Reading paper text and reading e-text are similar but not identical tasks and will require similar but not identical pedagogy in order to harness the nuances of each vehicle for instruction. Reich et.al (2019) describe the impact of the novelty factor of e-books on reading. They suggest that for young children, the novelty of reading on a device boosts comprehension. In looking at Reich et.al.'s 2019 work through the lens of the SAMR model, we can agree with their conclusions that when the task of reading is *enhanced* or possibly *transformed*, depending on the device used, the impact on comprehension is minimal.

When we consider the categories of the SAMR model that lie on the more transformative end (modification and redefinition), we are able to see that many students in this study chose to *modify* the task by listening to text-to-speech. It appears that more work might be needed in this area to further clarify the differences in reading comprehension and comprehension of auditory input while visually looking at a text. I did not have the scope to fully examine these differences in this small-scale study, although they might be examined more closely in future research. We can draw a few tentative conclusions from this exploratory study.

Each of the four students in the Kindle group who chose to listen to text-to-speech most days made progress, and three of the four students made accelerated progress. As previously mentioned, Sean made significant gains in reading comprehension. While we cannot isolate the impact of listening while reading on his comprehension, we can argue that listening to the text allowed him to modify the task in order to be optimally successful. In this study, we did not see any examples of the students redefining the task, which would be considered by Puentadura (2006) to be the most transformative use of technology. Quite possibly this is due to my own pedagogical decisions or limited technical capital. I might argue that my own view, at the outset of this research, was that an e-reader was a simple substitute for reading. This assumption may have impacted my instruction and pedagogy. I did not specifically plan for any ways to truly redefine the task – I simply taught the two groups using tried-and-true instructional methods.

While using Puentadura's (2006) model as a lens for analysis, I encountered some areas where I felt it was not the most effective tool. I found that the model seemed too rigid, with clear lines demarking the types of task. This finding is supported by the research discussed in section 2.5, specifically that of Fox and Alexander (2017), who suggest that perhaps we must reframe our thinking about comprehension to view it as a less linear, but more inter-related conceptual understanding of a variety of texts, and

those which suggest we need to consider digital literacy to be an more fluid, interrelated concept (Pegrum, 2019; Dudeney, Hockly and Pegrum, 2013; McDougall, Readman and Wilkinson, 2018). To that end, I have concluded that Puentadura’s (2006) model needs revision in order to make it applicable to a modern teaching situation.

In practice, not all instruction falls into neat, discrete bands. For example, when students were asked to read the text independently, they were welcome to *modify* the task by adding the text-to-speech function, and this was a choice that individual participants made on their own. They might have also augmented the task by manipulating the font. At points during their reading, I asked the students to slip their headphones off and read aloud to me, which meant they were no longer modifying the task, but they had still augmented their reading. It becomes further murkier when we consider that these students were asked to refer back to the text and potentially read it aloud to the group during the discussion part of the lesson. If they had listened to the text using headphones, would this still be considered *modifying*? After all, they weren’t changing anything during this segment of the lesson, but arguably their comprehension had been enhanced by the modification that took place during their reading. A case could be made in either direction, but the nebulous nature of actual teaching practice leads me to suggest an adaptation of Puentadura’s 2006 instrument in order to render it more effective and precise for evaluating instructional practice.

FIGURE 9: The researcher’s proposed modification to Puentadura’s 2006 SAMR model.

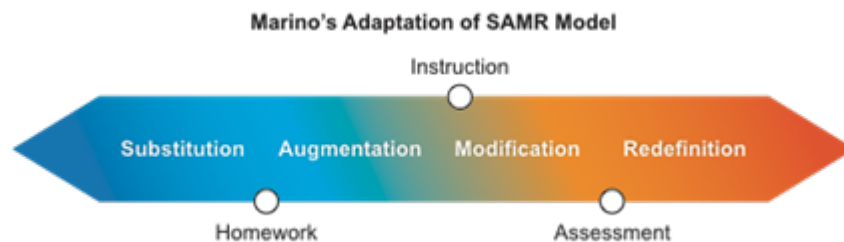
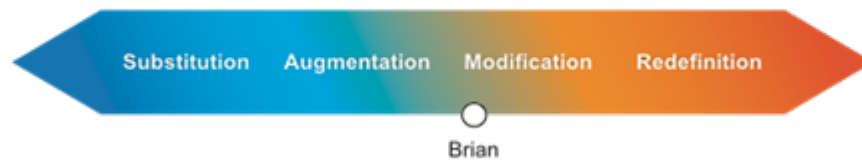


FIGURE 10: A suggested application of the proposed modified SAMR model identified in Figure 9.

Marino's Adaptation of SAMR Model



This theoretical model might be more practical if it looked like Figure 10. In my adaptation of the SAMR model, I have eliminated the perceived hierarchy. I found that when using Puentadura's (2006) model as an instrument for analysis, I found it more practical to think of it as more of a continuum. I also found it was easier to place the tasks I assigned students and the way the students tackled them along a sliding gradient. There were times when I wanted to 'slide' a task along the gradient, or perhaps when something a student did nudged a task from one band closer to another. Using Puentadura's 2006 triangle-shaped model, I felt that the clear lines and discrete categories forced me to slot student reading into neatly labeled boxes. While this worked in some instances, the reality of working with students in actual practice is not as ordered. For example, when Brian was reading in his head along with the text-to-speech, then seamlessly cast off his headphones to read aloud to me, then resumed reading in his head and forgot to put his headphones back on, I struggled to categorise this work. I wanted to consider it modification but felt that it wasn't purely a modification of the task, because at times he was reading in a more traditional way, albeit augmented by his choice of font and background colour. It seems more precise to place Brian's work on a less rigid continuum, and I argue that it is heading mostly towards modification but perhaps not all the way there. In Figure 10, I have offered an example of where Brian's tasks might fall on a continuum model.

If we choose to consider the SAMR instrument as more of a continuum, it becomes more functional for teachers in terms of planning and reflection. Teachers could consider using it as I did in Figure 9, to plot the tasks I set students along the continuum, or as I did in Figure 10, to plot individual students' activities along the continuum. In this way, teachers could have a visual representation of their lessons and their students' abilities and plot their use of technology points on the continua in a way that could foster deeper analysis. Researchers (Rose, 2011; Hau et al., 2017; Mangen, 2016) agree that the inclusion of technology into classroom instruction is a work in progress, needing more research, and likely a different approach for each teaching situation. A tool like this may help teachers and students to consider the grey areas when adapting instruction to include technology.

6.8 Kindle books require explicit instruction.

In keeping with the current research, we can argue that teachers should model explicit teaching strategies and offer students frequent opportunities to practice these specific skills (Ankrum, Genest, and Morewood, 2017; Coiro and Dobler, 2007; Skidmore, Perez-Parent, and Arnfield, 2003; Johnston, 2004). In this section, I will examine the literature that relates to the impact of teaching practices on student reading skills.

The curriculum in use at Z Elementary requires teachers to explicitly teach the different characteristics of fiction, poetry, drama, narrative nonfiction and expository text. We teach students to use these key characteristics to make reading the text easier. For example, when students read expository text, they are taught to look for headings and subheadings as signposts to help them understand the organization of the text, and to know what they will read about next. This explicit teaching is instrumental in building skill in reading comprehension.

It seems, from the data collected in this enquiry, and supported by recent research (Ankrum, Genest, and Morewood, 2017; Coiro and Dobler, 2007; Skidmore, Perez-Parent, and Arnfield, 2003; Johnston, 2004, Mangen, Olivier and Velay, 2019). that students need explicit teaching in the differences when reading an e-book and reading a paper book. While the foundational skill is the quite similar, as it is when reading a play versus reading a novel, there remain some key differences that impact comprehension. Consider the following example.

M.Marino: “We are looking for examples of descriptive or figurative language...”

[Brian has hand raised before the teacher even finishes her sentence and he appears eager to share first. He has his Kindle highlighted and is ready to use the evidence in the discussion].

M.Marino “Brian wants to get us started, and I love that Brian has highlighted so that he would remember.”

Brian: “The mayor’s office was large and smelled like hair...t-t- tonic?”

[appears to stumble or question use of word ‘tonic’].

M.Marino: “Hair tonic. Yeah. It’s like hair gel that people used to use.”

[During the lesson, Brian often scrolls through his Kindle to located highlighted passages, then raises his hand to share.]

Brian: “His eyes sparkled in the sunlight.”

M.Marino: “His eyes sparkled in the sunlight. Whose eyes were sparkling?”

Brian: “Um, the the Indian... person?” [points to illustration on Kindle].

M.Marino: “Stone Fox?”

Brian “Yeah.”

In this extract, we can see that Brian is confident and comfortable with the task at hand, evidenced by his eager participation. He is easily able to navigate the Kindle and use the highlight tool to mark passages he wants to discuss. We might consider this modification of the task of reading that was available only to the Kindle group. The paper book group, due to reading school-owned texts, was not permitted to mark up their books. In some venues, such as a university student who owns the text and can physically alter it as he pleases, use of the highlight tool is simply a substitution. However, in the case of a primary school student who reads a book that cannot be marked, use of the highlight tool could be considered modification of the original task. It can also be argued that Brian is still struggling with some more advanced vocabulary, as he appears slightly confused at the term ‘hair tonic’, which was not a vocabulary word that was pre-taught in the book introduction. Despite his confusion at this term and the fact that he forgot the character’s name, he is able to offer solid examples of figurative language, which was the objective of the lesson.

This interaction with Brian is illustration of a time when explicit instruction in e-book tools would have helped the student. The teacher might have said “If you don’t know that use of the word tonic, press on the word with your finger and a dictionary will pop up. Let’s have a look and see if one of those definitions makes sense in this context.” Brian would have needed instruction in how use a dictionary and the fact that it includes multiple word meanings, and he would have also needed instruction in how to access an e-book’s dictionary tool. However, based on Brian’s skill level with Kindle devices as we have seen in preceding sections, we can assume that he would be easily able to make the dictionary tool work for him once he had been taught the skill and been given some time to practice it. Although I did not offer him any instruction in the use of the dictionary, I do hope that future teachers will do so, and that as he becomes more adept at using e-books and their tools, Brian might take on use of the embedded electronic dictionary to use when he encounters an unfamiliar word.

When I interviewed Brian, who chose to listen to text-to-speech and made twice the expected progress over the course of the enquiry, he expressed a strong preference for e-book over paper book. He stated that he has an iPad at home and that he reads books on it. This claim was backed up by his family survey, where his parent said that he uses an

iPad and the reading software RazzKids at home. He said, he thought reading on the e-book was easier because "...you just mark a thing you wanted to share, or where you are." He also said the tool he likes best on an e-book is "... listening on the headphones." His statements are well-supported by his behaviour during the lessons, as he was one of the only students to reliably use the text-to-speech features and the highlight tool. Brian also exhibited a little sense of humour, when he said "I like the e-book! All I have to do is read and swipe instead of getting a paper cut!"

It seems that we can make a strong argument for Brian's accelerated progress in reading during the inquiry being at least partially attributed to his level of comfort with the e-book genre and his use of its unique features. He was not distracted by the tools and in fact used them as they are intended- as supports to aid his reading. He demonstrated excellent comprehension both in the lessons and on the end-of-enquiry BAS. It seems that, as he already knew the capability of the Kindle to support him through use of highlighting and bookmarking, he was able to use it without specific instruction at school. In this way, the application of home-learned technology skills is quite similar to a student who has prior content knowledge about geography or history from outside experiences and is able to apply it to extend his skills in the classroom.

Another student, Alanna, a member of the Kindle group, made the expected three months of progress during the enquiry period. She was unclear in her preference of text type. She said she finds an e-book easier to read because "...if you tap on a word it gives you the definition. What it means." Alanna's parent, when asked about home reading habits, said that she does not own a Kindle or iPad, and if she reads at home, it is always paper books, which she obtains from the store or the library. Despite the fact that Alanna seems to know that the dictionary feature exists, and she says it makes reading on an ebook easier, I did not see any evidence of her using that feature during guided reading or the book discussion. It is possible that she has heard that these tools exist, but without explicit instruction or direction to use them, she seems to be only aware of them in theory, but unable to use the tools to assist her in reading. Since she does not have any experience with reading e-books at home or outside of school, her only exposure to this genre is in a classroom setting. Arguably, with more practice and directed teaching on an e-book and its features, Alanna might be able to use the tools to facilitate improved reading comprehension. While we cannot attribute her lack of accelerated progress solely to her lack of facility with e-book features, we can contrast it with Brian's high level of comfort and skill with ebook tools, and the fact that he made twice as much progress on the BAS as Alanna did.

Consider Maureen, a student in the Kindle group who did not demonstrate any gains in reading comprehension on the BAS. During the semi-structured interview, Maureen read a passage about mummies, and I asked her about what text features helped her while she was reading the book. She gazed absentmindedly at one page and did not scroll back or attempt to look at the book, despite prompting to look back. Later in the conversation, she said she prefers a paper book "...because it's easier. It helps me understand more than the Kindle. The Kindle... there's a lot of stuff you can do so you get distracted, but on paper, it's pretty hard to get distracted." Her family says they own a laptop, but at home, she reads paper books that she gets at the public library. It seems that due to inexperience and personal preference, she was not as comfortable using the Kindle as her peers were. It might be argued that her inability to use the Kindle comfortably negatively impacted her reading comprehension. For example, turning pages back to scan for a specific word might be easier in a paper book, but if a child knows how to use the 'search' feature of an e-book, searching for a word is very easy. It seems here that when a child is not a regular and experienced user of technology, the technology can be a hindrance to learning. This idea gives further support to the notion that teachers will need to engage in explicit teaching of technology related skills. If children come to school with unequal skills and knowledge of the tools that e-books offer, teachers may need to fill in the gaps so that each student can make the best use of the technology in front of him, if the school is promoting reading on e-books.

Of three students who did not make any progress on the BAS, two were in the Kindle group. Maureen and Thomas, the two Kindle group students who demonstrated no progress, were in different Kindle groups and read different books. While it is impractical to go into detail regarding the specific challenges that each child had, it is important to note that these children were both referred for further evaluation, as neither one was making adequate academic progress in the classroom. However, on the family survey, both children's families stated that their children had asked to purchase books for a laptop or e-book. Both Maureen's mother and Thomas's father said that they felt their child's reading had improved over the past few months and they were demonstrating more enjoyment at home. Thomas's father said, "Before, my son would never pick up a book in his free time. Now he's more interested in reading a book. Thanks for the great work." It is important to note here that although they did not make measurable academic gains on the BAS, that assessment is merely one measurement of gain in literacy skills. I did see evidence of each of these children demonstrating some comprehension during our lessons, and it is clear that they are learning to enjoy books and bring that level of interest home. It is reassuring to think that these children are learning to enjoy reading more, and

I hope that their enjoyment of reading will continue to grow, which will hopefully strengthen their reading skills going forward.

6.8.a Distraction

The novelty of the Kindle devices was certainly a factor for some students, and the distraction and temptation to scroll through the text, fiddle with the buttons or change the settings became a challenge for some children. This is contrary to the work of Reich et.al (2019), who found that the novelty of reading on a device caused an uptick in performance, although they studied preschoolers, and I was working with primary school aged children.

Consider the following situation where Ian, a Kindle group student who made six months of progress over the course of the inquiry, is trying to cite examples from the text to begin a group discussion.

Ian: “Um on page this page [is unable to give a page number] ... it says Jackie led a Pacific Coast conference for 2 years in a row.... It means he won, basically, the UCLA meet of the Pacific Coast conference. He won.”

While he is offering this example, the other students are not able to find the same spot, and they are instead looking at camera, looking at own Kindle devices, or staring into space. The fact that Ian is unable to identify a specific page and the children are unable to all be physically looking at the same place results in a less-than-focused group discussion.

In reviewing the video, I realised that I could have spent a bit of time helping the students all get to the same point in the text. While Kindle devices do not reliably have page numbers, they do have location numbers. However, it seemed that the location numbers were impacted by the choice of font and size of font, so students never had the same page at a location number. In my field notes, I noted often that it was unwieldy to get us all to the same point in the book, and often involved me taking each child’s individual Kindle and helping him/her get there. I also had to use prompts like “Find the page where we see the picture of Harriet. Then, go down about three paragraphs. That’s where we are.”

It seems to me that this is more of a weakness on the part of the teacher than the students. If I had more facility with finding page numbers and locations, or more experience anticipating where the children would have trouble, I could have taught the skill of finding the same place in the Kindle, despite the lack of page number. It seems in this case that my own lack of technical capital came into play, and it appears that some explicit teaching would have been helpful in order to help the students and teacher all get

to the same place to see the example. Arguably, this is a hindrance that is Kindle-specific, because in a paper book, the page number is always consistent. Here again, we see the way that Kindle formatting and digital skills played a role in this research enquiry.

Another day, with a different Kindle group, I made the following statement during my instruction: “Friends, we are looking at Jane and our *Kindles are down*.” This is in response to Jane’s point about Harriet Tubman and I noted, while watching the video, that her Kindle is face down on the table, and she is not calling us to a specific place in the text (which was the objective of the lesson). Soon after that, I noticed Declan spinning his Kindle round and round and aimlessly pushing buttons. I removed the Kindle from his hand and put it on my side of the table.

It seems to me, while watching this video months after the lesson, that I was expecting this Kindle group to do something different to what I asked the paper group. I promoted the paper group very often to “Go back into the text...” and while I wanted the Kindle group to do the same, it appears from these examples that I was being contradictory to my objective. How could I expect a child to go back into the text and seek an answer when he does not have it in his hand, or it is face down on the table? Again, we see an example of a teacher who would benefit from more practice working with e-books, and perhaps some professional development about how to manage the distractions that these devices offer.

It might have also been confusing for the children when the teacher relied on a paper book during instruction while the children were using Kindles. In the following example, we see students who are disengaged and struggling to produce meaningful responses to the text.

MM “What was a lot of this chapter about?... What did he like doing, Maureen?”

[students are sliding fingers across screens, appearing to flick without purpose]

Maureen “He liked to fly planes?”

MM “He loved to fly planes!”

Sinead “He loved .. .engineers?”

MM “...He liked engineering. He liked aeronautic engineering. So he enjoyed flying planes and what kind of planes did he like the most? What did you read about in the that section?”

Sinead “X15... the X15?”

MM “Why did he like that?”

Students “Mmmm....?”

Students sliding screens back and forth, peering very closely at the screens, but not responding.

MM “He liked about that, that it went fast, right?”

Maureen “Um four and thousand miles per .. an hour.”

MM “Mmm hmm.”

MM takes out the paper book which has sticky notes placed in it.

MM “He says right here. We were using airplanes as tools to gather all sorts of information just as an astronomer uses a telescope as a tool. We didn’t fly often, but when we did it was unbelievably exciting. So why Joyce, why do you think he wants to go to outer space. What do you know about him as a person and what are you thinking.

[Joyce slides the screens back and forth in a desultory manner]

MM “Joyce, take your hands off the Kindle and just think about this. We just talked about the things he likes to do. Why do you think he wants to be an astronaut?”

Although it pained me to watch this video months after the teaching had taken place, it was a valuable piece of data. I realised that I might have inadvertently been sending them the message that information is more easily gained through the use of paper books and not e-books. By saying to them “... He says right here...” and using the marked paper text, I am sure I sent a mixed message about how to gain information from the text. We can also see another example of a time when I asked the children to remove their hands from the Kindles, in a misguided attempt to quell distraction. Increased professional development and emphasis on improved practice will be essential for teachers to avoid pitfalls such as this.

6.8.b Outlier- Sean

One outlier in the data was Sean, a Kindle group student who made twenty months’ progress on the BAS during the three-month enquiry. Sean’s family said he has always loved to read and that at home he reads paper books which are gifts or come from the bookstore. He has an iPad at home but does not read on it. This is somewhat surprising, because if the theory is that exposure at home and well-developed technological skills assist in comprehension, we could expect that Sean would be an experienced reader of e-books. It may be worthwhile to note that Sean is a native speaker of English who brings a level of background knowledge and language skill to the lessons that several of his peers do not. It is possible that although he does not read on his iPad, he has developed strong technological skills that supported him well in using the Kindle to gain information from text. The focus of this study was not the impact of background knowledge on comprehension, but it is worth considering the weight of background

knowledge versus digital skills in future research. It is unclear if explicit instruction in the tools available on an e-book would have allowed Sean to make even more progress. Arguably, explicit teaching would not negatively impact his comprehension, but it might be unnecessary for this specific child. However, the fact that he is an outlier in the data set supports the argument that targeted teaching of e-book specific skills might be important for all students.

6.9 Conclusion

In examining the data, we can see that despite the differences in type of instruction, the two groups in this study made similar progress. Even with the addition of paper based supplemental tutoring for some participants in each group, the overall progress in each of two groups in the study were comparable. We cannot ignore the impact of family involvement and background experience on student reading comprehension, and we see evidence from this study that oral language has a significant impact on reading comprehension regardless of text type, and technical capital has an impact on comprehension of e-books.

One significant trend here is that students who took advantage of the text-to-speech feature offered by the Kindle device tended to demonstrate increased comprehension skills on the BAS, a paper assessment. While these findings are not generalizable due to the small scope of the study, they do indicate trends that will be interesting for future research. It appears that in this setting, children who used the audio support in order to boost their comprehension skills were able to retain and transfer those skills to paper-based assessment.

At the outset of this enquiry, I suggested that a reasonable working definition for ‘reading’ during this enquiry might be:

an interactive process by which readers rapidly use active processes in order to gain meaning from written text, *potentially supported by auditory or graphic enhancements.*

Some students in this study availed themselves of these auditory enhancements and were able to make accelerated progress in reading. With the prevalence of reading e-text, appears that the definition of reading may need to change in order to include use of these supports. More research will be necessary in order to determine if these trends hold true with larger and more varied populations.

Another area that will require further research is the variability of e-text. The visual challenges presented by some of the Kindle books were unanticipated barriers to comprehension.

Finally, it seems that educators might need to consider ‘e-book’ as a separate genre from paper books, and within that genre, teachers will need to explicitly teach the e-skills that must be mastered in order to make best use of the technology. One of these tools might be to use the text-to-speech tool to listen to the text in order to boost comprehension skills. Another area where some explicit teaching might be needed is for the teachers themselves to become more comfortable using e-books as the medium of instruction. When we examine the data using the SAMR model as a critical lens, we see the potential for Kindle devices to transform instruction, but teachers may require specific training.

Chapter 7

CONCLUSIONS

7.1 Introduction

It seems, as indicated by the research findings in the preceding chapter, that text type *may* impact student comprehension, but there are other factors that must be taken into consideration or examined more closely. These findings are not derived from a large sample and serve as starting points for larger investigations.

When I set out to examine the impact of text type on student comprehension, I was inspired to do so by the research suggesting that more empirical work is needed to investigate the impacts of digital devices on literacy. My small-scale study's results correspond with those of earlier researchers, as mentioned in Chapter 2 (Mangen, 2016; Jamshidifarsani et al., 2018; Rose, 2011; Mangen and van der Weel, 2016; Cho and Afferbach, 2017; and Hau et al., 2017) The use of e-books as a medium of instruction is a relatively recent addition to primary classrooms, and more work will need to be done in order to fully understand the impact of a shift to e-text. In particular, if we operate under the assumption that e-books are a permanent fixture in classrooms, more research and teacher training will be necessary to foster teaching practices that match the medium of instruction. I relied on Puentadura's 2006 SAMR model as a theoretical framework from which to make some assertions and suggestions. In the next sections, I examine the main findings emerging from my research, and attempt to address each research question. Next, I propose some modifications to current teaching practices and prompting that might help harness the power of e-books. I then identify the limitations of this small-scale study. Finally, I outline some of the topics that I identified as requiring future research.

7.2 Main findings

7.2.a Does the use of electronic texts as the basis for small group reading instruction in 9–11-year-old students impact student reading comprehension, as measured by the Fountas and Pinnell BAS and discourse analysis?

The results of this study were inconclusive with regard to the effect of e-books on student reading comprehension during small group instruction. Both the paper and e-book groups made similar overall progress on the quantitative measure (refer to Chapter 6, Figure 6 and Figure 7). However, when examining the trends in the qualitative data, it seemed that there were greater variations between the two groups. Overall, while the general performance of students was similar, there were trends in the qualitative data that

indicated that some supports offered by the Kindle might enhance comprehension and bear further research. It is also clear from this research that more attention needs to be paid to the digital skills students have prior to interacting with e-text, as indicated in Chapter 6.

7.2.b What is an e-book?

One finding that resulted from this research is that variable text appearance impacts primary school students. When using Vassilou and Rowley's (2008) broad definition of e-book, the texts I used in this study were all considered e-books. However, as discussed in detail in section 5.4, and in keeping with existing research, the wide variation in e-book appearance impacted students' abilities to manipulate the text, to gain information from the diagrams and tables, and to enjoy the illustrations (Rose, 2011; Hau Rashid and Lee, 2017). In order for students to successfully understand content in an e-book, they must be comfortable and confident with how access the text, and in order to gain this level of comfort, it is likely that pedagogy must shift to include explicit instruction.

7.2.c. How is reading comprehension defined as it pertains to 9-11-year-old students who receive small-group reading instruction in a state school in Massachusetts, USA, bound by state and local curricular requirements?

While I did not alter the definition of reading comprehension that I used as the foundation of the study, the findings indicate that it may be time to redefine reading comprehension, taking into account the use of e-text. For example, the students in this study who chose to use the text-to-speech tool during instruction demonstrated improved comprehension, even when measured using a paper assessment. There are many questions to be answered in future research surrounding the use of audio supports. As examined in section 6.6, there may be different ways to approach reading comprehension when we take into account text type, and more research is needed to tease out if the use of text-to-speech is an augmentation of reading or a completely different skill. It also may behoove researchers and teachers to reexamine their definition of reading, in order to encompass some of the technological supports available in e-text.

7.2.d Can a combination of the Fountas and Pinnell BAS, teacher field notes and discourse analysis be used to compare reading comprehension for 9-11-year-old students who receive small group instruction using Kindle devices as compared to those who receive small group reading instruction using paper texts?

The results from this study indicate that the combination of qualitative and quantitative data collected can be used to compare student progress in reading

comprehension. When using the BAS as the measure, it appears that text type does not have significant impact on student reading comprehension, as discussed in Chapter 6 and demonstrated in Figure 6 and Figure 7.

When using discourse analysis and teacher field notes as the method for analysis, the findings display more nuance. It appears, from the qualitative data, that student oral language ability impacts reading comprehension across both types of text, as discussed in section 5.5. The data also indicates that outside involvements, such as experience with e-text at home, may impact students' abilities to gain understanding of e-books, as explored in section 6.6.

7.3 Recommendations for practice

As a reflective practitioner, I found that this research project lent itself naturally to identifying recommendations for improved practice when using Kindle devices for reading instruction in a small group setting. I have outlined these recommendations below.

7.3.a Kindle books require explicit instruction.

A recurring theme during analysis was the idea that e-books require some specific instruction. In keeping with existing research (Mangen, 2016; Cho and Afferbach, 2017), I found that teachers will need to take specific skills into consideration and find ways to teach them. Many primary school teachers are adept at teaching units on nonfiction text elements and calling students' attention to the unique features that authors of nonfiction texts use on a regular basis in order to help students comprehend nonfiction text. For example, just last week I was teaching a lesson on the use of subheadings and how students can use them as a roadmap to guide their reading. I was able to find examples of these text features in a variety of texts and instruct students specifically on how to use these features in written text to support their comprehension. It seems clear that students, and perhaps some teachers as well, may need explicit instruction in the specific areas and features unique to e-books. There are many tools available to Kindle users, but they are not necessarily intuitive. Students who do not regularly use e-books at home will require a bit more instruction than those who have experience and exposure, just as students who do not read paper books at home need more explicit instruction than their peers from more literate homes. For example, using the dictionary feature on a Kindle is easy and extremely helpful once you know how to do it. For students who need to build vocabulary skills, the dictionary tool might be extremely helpful. A minilesson on how to press and hold a finger on an unfamiliar word (and perhaps how to read a dictionary entry) would be necessary for students who do not know about this feature. It

would also be helpful to show the students before it happens inadvertently- reducing the amount of times the teacher might hear “Help! A box popped up here on my Kindle and I can’t get it to go away!”

Despite the slightly better progress made by paper group, we cannot say unequivocally that paper books are better than Kindle. I contend that reading on Kindle is a different genre, similar to nonfiction, poetry or drama and teachers must view it as such. Teachers should familiarize themselves with the differences in reading e-books to reading paper books and teach students how to read e-books as a different entity. I propose that the reason the students who read paper books performed slightly better on the BAS is that they had already been taught to read the genres we were reading, including biography, or fictional narrative. Students in the Kindle group did not have the explicit genre teaching needed to make the same gains, and some of their cognitive attention and instructional time were spent wading through the nuances of reading e-text.

I choose to use the term genre here in the colloquial manner used in teaching practice; most literature teachers are familiar with genre studies and the different genres to which students must be exposed at different points. I concur that it is possible that e-reader may actually be a separate ‘text type’ as distinct from genre, according to researchers (Paltridge, 1996; Lee, 2001). It is beyond the scope of this study to fully examine the differences between text type and genre, and in my writing I have used the term text type to mean paper versus e-book. In future research or writing, it might be important to further clarify whether this separate reading skill should be classified as a genre or as a text type.

Considering ‘e-book’ to be a separate genre with unique features that must be explicitly taught to young readers might help bridge the potential gap in learning between e-books and paper books. An e-book genre study, similar to a unit on drama or poetry, as a free-standing unit of instruction, as demonstrated by this small-scale study, is not likely to be not be detrimental to students, and might in fact offer them valuable skills to use as they venture forward into academic careers where they will likely come into contact with more e-text. In the next section, I will outline some suggestions for those skills, which would fall under the digital literacy umbrella.

7.3.a.1 Specific e-book skills

There are some distinctive skills that would need to be included in the e-book genre. Students will need to be taught to use the text-to-speech feature, the dictionary, and how to alter font and background colour. They may need to learn more effective ways to read the charts and tables that appear in the book, especially if the graphics appear differently or are not labeled the way children might expect them to be, based on their experiences

with paper text. Students are likely to need to learn how to utilise the percentage read as opposed to page number for the purposes of group discussion. I did find that students were more likely to become distracted by the Kindle, as evidenced by the interactions with students discussed in section 5.8, possibly because they were literally not on the same page as I was. Students and teachers will require practice to get to the same place at the same time to maximise instruction and minimise distraction or students feeling lost.

This is by no means an exhaustive list; as e-text evolves, we will need to modify our curricula for e-text as a genre. This feature is unique to e-text. Paper books retain the same features and interface, and have done for centuries, so once a person masters those skills, s/he is able to continue using them in the same fashion forever and transferring them to all printed materials. The changeable nature of e-text, along with the variations (iPad versus Kindle versus reading on a computer screen) may prove to be a challenge in forming a clear scope and sequence. Teachers may also have to learn alongside their students in order to fully harness the tools that e-books might offer. One area I have identified as particularly important is that teachers will need to be mindful of their language and teaching strategies whilst using e-books. In the next section, I will offer a suggestion of an adaptation teachers might need to take up in order to improve the reading skills of students reading e-books.

7.3.a.2 Suggested e-book prompting guide

When I was reviewing the videos, I was combing them for student outputs, but I also found myself drawn to studying my own teaching. In planning to record the comprehension conversations, I thought I would focus heavily on student discussion. While I was able to use student discussion as evidence to support many claims, I did find myself making judgements on my own use of language and prompts during instruction. Naturally, armed with the hindsight of the children's progress or lack thereof, I am able to hyper-focus on the prompts I used to draw out insights and foster higher order thinking skills. My findings seemed to echo those of Goodwyn's (2013). While the technology continues to evolve, so too much the teacher's methods in order to fully embrace all that the e-reader has to offer.

As I noted in my analysis, there were times when I could have used Kindle-specific prompts to help the students clarify their thinking or to offer instruction on Kindle skills. Using Moody's (2010 p. 29) as a guide, I have included this chart as a sample of a prompting guide that would support teachers in their practice. This is a further example of Kindle-specific instruction that teachers will require.

Figure 11 is an example of such a prompting guide. I selected some common areas where I found my own prompting to be lacking or too heavily paper-centric and suggested a prompt that might have been more effective for student learning.

FIGURE 11: Table providing sample prompts utilized by the researcher to support targeted reading skill development with differentiated prompts based on text type.

Sample Prompting Guide

Desired reading skill	Traditional paper book prompt	Kindle-specific prompt
Close visual attention to a word	"Put your finger on that word."	"Hover your finger over that word." or "Find that word with your eyes."
Improved fluency	"Read it like me."	"How does the narrator say it?"
Identifying supporting details in the text	"Show me the place in the text where the author..."	"Use your highlight tool to mark the places where the author..."
Defining new words	"Use context clues to determine the meaning" or "Use a dictionary to look up that word."	"Use your dictionary tool by holding your finger down on the tricky word. A definition, like you would find in the dictionary, will pop up."
Calling the whole group's attention to one spot.	"Everyone turn to page 17."	"Everyone should be at location 26, right after the graphic."

*For some e-book versions

7.4 Limitations of the study

As referenced in Chapter 4, there were several limitations to this exploratory study that arose due to its setting. Action research, conducted in the field, can be subject to influences that studies in laboratory settings are not. The data from this small-scale study was impacted by student absences, student relocation, and potential differences in homeroom class teaching. As it is only a small-scale study, designed to generalise to theory and inform future research, this study has limitations that a larger-scale, more quantitative study might not.

7.4.a Outside experience

One limitation of the study was that I was unable to control for in this setting was the outside experience of the participants, as discussed in section 5.5. For example, students who talked about the books and lessons at home might have displayed increased

comprehension, but I did not have the scope within this study to examine home interactions and how they might influence my results.

I was pleasantly surprised to see that the impact of the supplemental tutoring scheme, which I identified as a potential limitation, seemed negligible on the data I collected. I anticipated that the addition of tutoring for some students might pose a large limitation on my data and render it less significant. However, as evidenced by Figure 8, it seems that this was an outside influence that was not a significant limitation of the study.

7.4.b Variable e-text appearance

A limitation of this study that I had not anticipated at the outset was the varying appearance of Kindle texts. In future research, the books might need to be previewed before selection in order to more carefully choose those with uniform text. As discussed in section 5.4, the variation in presentation among the texts impacted students and their ability to access the books.

7.4.c BAS

As referenced in Chapter 2 and Chapter 4, use of the BAS as the quantitative measure of data at the beginning and end of the enquiry could be considered a limitation. Reading comprehension is a nebulous skill and can be difficult to measure in a systematic fashion, as discussed in Chapter 2. The BAS has its critics, and while it is a widely used tool, it is not an internationally normed measure of reading comprehension. Use of the BAS in the research design was a necessary component of the practical research design I used, because it is the mandated measure used in this elementary school.

The use of the BAS as a paper assessment, while a limitation, did lead to some interesting implications for further research, as discussed in section 5.2. If students use text-to-speech supports to aid comprehension, it seems from this research that it may be a transferable skill to a paper assessment. This bears more research in due course.

7.4.d Video recordings

One limitation of the study I identified during the data analysis was that I had only taken the video recording during the discussion part of the lesson. It would have been very valuable to see the book introduction piece, in order to identify more trends in the data. I had anticipated that the bulk of comprehension instruction would take place during the book discussion segment, so I took video during that piece of the lesson. In order to examine the book introduction and analyse my prompts and student responses, I referred to my field notes, which were not as revealing as video of the book introduction might have been. As discussed in section 5.4, student oral language was an important

component of student reading comprehension. In a larger scale study, the researchers might consider taking video of the entirety of the lesson to gain the largest amount of data. I often found myself wondering, when a student struggled with something, if I had addressed it in the book introduction segment or if I had left it for the children to work out independently. This limitation of the study is a result of my research design and could easily be overcome in future research.

7.5 Recommendations for future research

This research has indicated several areas that are worthy of future research. Some of these areas I might have predicted would require further research, and others came about as I collected and examined the data produced during the enquiry.

7.5.a Text-to-speech and its impact on instruction and assessment

One area where future study will be important is the area of listening to text-to-speech and its impact on reading comprehension. While it was not within the scope of my study, I did note that future research is necessary to examine the impact of the text type used during instruction versus the text type of the assessment. For example, in my case, the Kindle group received their instruction digitally, but they were assessed using a paper text. The transferability of skills from paper to computer or from e-book to paper is something worth close examination and may be applicable to students and adults alike.

Researchers will need to examine the subtle differences in reading text and listening to it, the impact of listening on visual discrimination of words and letters, and the transferability of this skill to a measured assessment. It appears, when we consider Brian, the boy who listened most frequently, that listening to text-to-speech helps increase comprehension across all types of text. It is important to note that he was assessed using the BAS, which did not allow him to listen, and he still made dramatic progress. His increased comprehension of text was not only demonstrated when he used the text-to-speech features during instruction, but when he was performing an independent paper-based task as well. More research will help us to clarify if he were in fact an outlier, or if this is a true benefit of using auditory tools to support or enhance reading. This might be especially relevant in schools where students are using technology as a routine component of instruction, but where standardised assessments remain paper-based. The reverse situation might also be an area to consider closely. It would be interesting and potentially important to examine the implication of the difference in comprehension in school settings where standardised testing is conducted using computers or tablets, but where *instruction* is still largely paper based.

It is important to point out that although it appears from the quantitative data that the paper books group made slightly more progress on average, the children were assessed using a paper-based assessment. The type of assessment matched the type of instruction they received. The consistency, exposure to text features in a similar format, and level of familiarity with paper text might have been the reason the students in the paper group performed slightly better on the BAS. The Kindle group were required to transfer the skills they learnt during instruction on a Kindle to a paper-based task. It is also important to consider that the bulk of their instruction outside of small group reading was conducted using paper texts, and small group reading was only one small facet of their learning during those three months. However, the discrepancies between medium of instruction and medium of assessment might be worth closer examination.

When we consider the question of listening to text and its impact on comprehension using Puentadura's 2006 SAMR model as a theoretical framework, it becomes clear that while initially I considered the text-to-speech tool as a *modification* of the task of reading, it might be more closely considered *augmentation* in the instance where the assessment task is still a paper-based text. More research might need to be done in order to fully delineate the differences between these two types of task, or in fact if it is necessary to do so. The combination of the use of a text-to-speech augmentation to the task of reading with the unchanged task of reading a paper book and answering questions might be a grey area that falls between *augmentation* and *modification* on the SAMR model (2006). It may be that in order to achieve truly transformative teaching, there will need to be shifts in assessment, or at least an alignment of assessment with teaching practice.

In addition to the larger question of the benefit of text-to-speech on comprehension, it might be worth researching further the impact of that tool on oral reading and accuracy. In primary school, students are expected to read aloud with accuracy and the nature of their decoding errors often drives instruction. It would be worth considering that adding this digital layer of support may impact such assessments, possibly by reducing the errors that children make in reading aloud. Further exploration surrounding reading accuracy may be worth future study, especially at the early primary and primary levels.

Another facet of the use of text-to-speech tool that might benefit from future study is that of the impact of oral reading fluency on comprehension, and the consequent impact of listening to text-to-speech on oral reading fluency. The impact of listening to text whilst reading for non-native speakers is also something that bears closer examination. As my study was conducted in an English-speaking country, it was not

within the scope of my study to consider books read in languages other than English. I think it is likely that we can assume that in the future, most e-books in a variety of languages will have the capability to provide readers with a natural-sounding text-to-speech audio support. Examining the impact of this auditory support on non-native speakers might be interesting. In the data I collected, it appeared to strengthen the comprehension of non-native speakers of English who chose to use text-to-speech to support their reading. The variable voice in the narration might also bear scrutiny- when it is a natural sounding speaker, it may be more beneficial for students who struggle with fluency than when the device reads it in a monotone or robotic voice. It is important to note that at the moment there are great varieties on 'voice' even within the Kindle devices, and certainly among different brands of e-book, but as technology evolves, this may change.

7.5.b Variations in e-text

Another area where there are vast differences among devices and within the Kindle genre is in the visual representation of the text. As devices evolve, it remains prudent to examine the visual effects and the impacts these have on reading comprehension. It was not an aim of my study to examine the visual differences among e-books, but my experience showed that there is greater variation in features, presentation and quality of e-books as compared to printed text. I was surprised at the lack of uniformity in Kindle book presentations. Even within my small sample size, I noted a wide range of quality among the digital texts. We might hope that as devices evolve, the differences in appearance to print text will shrink, but at the moment, we might want to examine these differences and their impact on student comprehension. I noted during my research that many students peered and squinted at the e-books, and that navigating charts and tables was particularly challenging. Even when they could change the appearance of the text, students had much to say about the visual challenges presented to them when reading on Kindle devices. This level of difficulty is variable across the different e-books and warrants further examination.

7.6 Final conclusions

The outcomes of this study, in keeping with current research, have suggested several crucial areas for future research, as well as indicated possible modifications to existing theoretical frameworks and professional practice. The data collected and evaluated led me to further research questions to be examined in due course. While it is not possible to make large-scale assumptions based on this exploratory pilot study, we

can take the advice of action researchers and use these findings to inform future research as well as our own teaching practices (Lewin, 1946; McKernan, 1996 and Elliott, 2015).

Reading paper text and e-text is a related but non-identical activity, and some skills that are e-book specific will need to be explicitly taught in order for students to become fluent and independent readers in this genre. I contend that 'e-book' might be considered a separate genre and will require explicit teaching to allow students to access every aspect of reading electronically. If these skills are left implicit, students who are knowledgeable about the technology will probably make gains from using these tools, but others, who are less familiar with the tools and nuances of an e-book, are less likely to make progress in reading comprehension. This is not unlike print literacy, where students who have early and frequent exposure to books find the uptake of literacy skills easier.

As a result of this research, I suggest a modification Puentadura's (2006) theoretical framework, which will have implications on future research as well as practical, professional applications. The idea that digital skills and technical capital might influence academic performance invites further research surrounding the risks and benefits of exposing young children to digital text. The crossover of digital skills and teaching practice examined during this study has led to my contention that Puentadura's 2006 model can be modified in order to be more applicable to teaching practice, as outlined in section 5.7.

One of the more fascinating, unintended findings from this study was that students who chose to use the e-book text-to-speech tool to enhance their reading were able to make gains in comprehension on a *text-based* assessment. The fact that these students were able to transfer the skills from one text type to the other and demonstrate improved reading comprehension is well worth closer examination in future study. It will be important to examine if transferability of skills is a one-way skill or if students might be equally able to use print literacy skills to make progress on digital assessments. Extrapolating these findings over a larger-scale study will help policy-makers and educators inform purchasing decisions and classroom practice.

The most important conclusion we can draw from this research is that reading e-books and paper books will require similar but non-identical teaching practice. Technology in the form of e-books may very well have the power to enhance learning, especially when using the text-to-speech tool, and when both teachers and students have explicit training in the skills necessary to utilise the tools e-books offer. However, if students and teachers are unprepared or unable to take advantage of its full offerings, an e-book is likely to neither enhance nor detract from reading comprehension in 9–11-year old students during small group instruction. Reading pedagogy must develop to take

account of the changes in literacy practice that e-books afford if these tools are to be used to their full benefit with young readers.

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CHAPTER 8
APPENDICES

APPENDIX A
CONSENT



Public Schools
School

December 1, 2017

T. Concern,

I, _____, principal of _____ Elementary School in Haverhill, MA, USA, grant Monica Marino, EdD candidate at the University of Bath, UK, permission to conduct her small scale pilot study in our school with fourth graders from January-March 2018. I note that she is examining the differences in reading comprehension between students who read on a Kindle and students who read paper books.

I understand that she will follow all standard ethical procedures, as defined by the university and AERA, including but not limited to: obtaining written permission from the parents/guardians of each child involved in the study, keeping data in a password-protects computer or locked file cabinet, anonymizing the names of the children, the school and the city in her findings report, and ensuring that the children participating in the study are not negatively impacted by their participation.

In addition, I have reviewed Mrs. Marino's research design and it provides the students with authentic experiences that are very similar to her typical teaching practices, so children and teachers should not be impacted or influenced in any way. In fact, the design will allow students to seamlessly transition from receiving reading support to the study and back to reading support, and other students in the classrooms may not even be aware that research is being conducted. This research will not negatively impact the students in the study nor the other children in the classroom.

Mrs. Marino's research design allows her to select students based on reading level and offers each family the opportunity to opt out of the research at any time if they so choose. She has obtained the Kindles using a crowd-funding source, Donors Choose, and at the end of the enquiry the Kindles will remain the property of the literacy room at Tilton School for student use. In keeping with school district technology policies, the Kindles will not be allowed to access the internet or wifi while they are in the school building. Mrs. Marino will use her personal wifi at home to download the books she purchases from her own funds for student use.

In keeping with local and state educational regulations, the BAS records are available for classroom teachers, parents, reading specialists and school leadership to review. Mrs. Marino's other records are her own personal records and she will hold them until they are no longer needed.

No one will be compensated for participation in the study. I look forward to seeing the anonymized results of this study.

Best regards,

Principal, _____ Elementary School

December 10, 2017

Dear

My name is Mrs. Monica Marino, and I am a Reading Specialist here at [REDACTED] Elementary School. I am conducting doctoral research surrounding the differences in reading comprehension when children read on an electronic book like a Kindle and when they read a printed book.

I will be reading with your child each day as usual, but I will also be taking video and audio recordings, using my daily notes, and perhaps interviewing your child and/or your family. I will share your child's progress with our principal, Mrs. [REDACTED], your child's classroom teacher, and the reading staff. I will share the results of my study with my supervisors at the University of Bath (England), but I will not use your child's name.

I will be seeing your child every day for approximately twenty minutes as part of regular reading instruction. I will take notes, video, and audio recordings of our lessons. Your child will read paper books with me.

Your signature below indicates that you grant permission to me to read with your child, record our lessons, use my notes in my study, and to share the results of the study. Please feel free to contact me at any time with questions, comments, or concerns.

Best regards,

Monica P. Marino
Reading Specialist
(contact information removed for anonymity)

Child's
name: _____ Homeroom: _____

Parent/guardian signature: _____

Date: _____

10 de diciembre de 2017

querido

Me llamo Sra. Monica Marino y soy especialista en lectura aquí en la Escuela Primaria [REDACTED]. Estoy realizando una investigación doctoral sobre las diferencias en la comprensión de lectura cuando los niños leen en un libro electrónico como un Kindle y cuando leen un libro impreso.

Leeré con su hijo todos los días como de costumbre, pero también tomaré grabaciones de audio y video, usaré mis notas diarias y quizás entrevistaré a su hijo y / o a su familia. Compartiré el progreso de su hijo con nuestra directora, la Sra. [REDACTED], la maestra de aula de su hijo y el personal de lectura. Compartiré los resultados de mi estudio con mis supervisores de la Universidad de Bath (Inglaterra), pero no usaré el nombre de su hijo.

Veré a su hijo todos los días durante aproximadamente veinte minutos como parte de la instrucción de lectura regular. Tomaré notas, videos y grabaciones de audio de nuestras lecciones. Tu hijo leerá libros de papel conmigo.

Su firma a continuación indica que me concede permiso para leer con su hijo, grabar nuestras lecciones, usar mis notas en mi estudio y compartir los resultados del estudio. Por favor, no dude en contactarme en cualquier momento con preguntas, comentarios o inquietudes.

Atentamente,

Monica p. Marino
Especialista en lectura
(Contact information removed for anonymity)

Nombre del niño: _____ Homeroom: _____

Firma del padre / tutor: _____ Fecha: _____

December 10, 2017

Dear

My name is Mrs. Monica Marino, and I am a Reading Specialist here at [REDACTED] Elementary School. I am conducting doctoral research surrounding the differences in reading comprehension when children read on an electronic book like a Kindle and when they read a printed book.

Because I am interested to see if there is a difference in how children understand books if they are read electronically, I will be using electronic books with your child's reading group instead of paper books. I will use the same measurement system to determine their reading level as we do for all students at our school. I will share your child's progress with our principal, Mrs. [REDACTED], your child's classroom teacher, and the reading staff. I will share the results of my study with my supervisors at the University of Bath (England), but I will not use your child's name.

The only difference your child will experience is that until March, your child will receive his/her small group reading instruction with me, using a Kindle, not paper books. If you do not wish for her/him to read using the Kindle, but do want to take part in the study, I can place him/her in a group that will read paper books. If you prefer that your child not participate in this study at all, s/he can read with another teacher.

Your signature below indicates that you grant permission to me to read e-books with your child and to share the results of the study. Please feel free to contact me at any time with questions, comments, or concerns.

Best regards,

Monica P. Marino
Reading Specialist
(contact information removed for anonymity)

Child's name: _____ Homeroom: _____

Parent/guardian signature: _____ Date: _____

10 de diciembre de 2017

querido

Me llamo Sra. Monica Marino y soy especialista en lectura aquí en la Escuela Primaria

██████ Estoy realizando una investigación doctoral sobre las diferencias en la comprensión de lectura cuando los niños leen en un libro electrónico como un Kindle y cuando leen un libro impreso.

Debido a que me interesa ver si hay una diferencia en la forma en que los niños entienden los libros si se leen electrónicamente, usaré libros electrónicos con el grupo de lectura de su hijo en lugar de libros impresos. Usaré el mismo sistema de medición para determinar su nivel de lectura como lo hacemos para todos los estudiantes en nuestra escuela.

Compartiré el progreso de su hijo con nuestra directora, la Sra. ████████, la maestra de aula de su hijo y el personal de lectura. Compartiré los resultados de mi estudio con mis supervisores de la Universidad de Bath (Inglaterra), pero no usaré el nombre de su hijo.

La única diferencia que experimentará su hijo es que hasta marzo, su hijo recibirá la instrucción de lectura de su pequeño grupo conmigo, utilizando un Kindle, no libros impresos. Si no desea que lea con Kindle, pero desea participar en el estudio, puedo ubicarlo en un grupo que leerá libros de papel. Si prefiere que su hijo no participe en este estudio, él / ella puede leer con otro maestro.

Su firma a continuación indica que me concede permiso para leer libros electrónicos con su hijo y compartir los resultados del estudio. Por favor, no dude en contactarme en cualquier momento con preguntas, comentarios o inquietudes.

Atentamente,

Monica p. Marino

Especialista en lectura

(contact information removed for anonymity)

Nombre del niño: _____ Homeroom:

Firma del padre / tutor: _____ Fecha:

The scoring section summarizes the oral reading: accuracy, self-corrections, and fluency for all levels.

- A chart to help you quickly figure the accuracy rate (the percentage of the total words that the student has read correctly) by tallying the number of errors on the coded text and circling the errors and matching percentage on the scale.

- A space to record the number of self-corrections (when the reader makes an error and then, without help from the teacher, corrects it).

Not Too Cold for a Polar Bear • Level Q • Nonfiction

Recording Form

Accuracy Rate	Errors	13	12-14	10-11	7-9	5-6	1-4	0
%	Below 85%	90%	94%	97%	98%	99%	100%	

Self-Corrections _____

Fluency Score 0 1 2 3

Fluency Scoring Key

- 0 Reads primarily word-by-word with occasional but frequent or inappropriate pausing; no smooth or expressive interpretation; irregular pausing; and no attention to author's meaning or punctuation; no stress or appropriate stress; and slow rate.
- 1 Reads primarily in two-word phrases with some three- and four-word groups and some mostly word-reading; almost no smooth or expressive interpretation and pausing guided by author's meaning and punctuation; almost no stress or appropriate stress; with slow rate most of the time.
- 2 Reads primarily in three- or four-word phrase groups; some smooth expressive interpretation and pausing guided by author's meaning and punctuation; mostly appropriate stress and rate with some slow-downs.
- 3 Reads primarily in larger, meaningful phrases or word groups; mostly smooth, expressive interpretation and pausing, guided by author's meaning and punctuation; appropriate stress and rate with only a few slow-downs.

Reading Rate (Words)

End Time _____ min. _____ sec.
 Start Time _____ min. _____ sec.
 Total Time _____ min. _____ sec.
 Total Seconds _____

$(60 \times 60) \div \text{Total Seconds} = \text{Words Per Minute (WPM)}$

- A four-point (0–3) fluency scale and scoring key for evaluating fluency (the way the reading sounds), including phrasing, intonation, pausing, stress, rate, and integration.

- A place to record the reading rate—the number of words per minute (WPM) the student read. Use the *F & P Calculator/Stopwatch* to perform the calculations or use the formula for calculating rate found here.

Recording Form

Part One: Oral Reading

Place the book in front of the student. Read the title and introduction.

Introduction: Pale Male is a red-tailed hawk. He made a nest on the ledge of an apartment building in New York City. Read to find out what happened.

Summary of Scores:

Accuracy _____
 Self-correction _____
 Fluency _____
 Comprehension _____
 Writing _____

Page	Start Time ____ min. ____ sec.	City Hawks Level M, RW: 214, E: 13	Sources of Information Used								
			E	SC	E			SC			
					M	S	V	M	S	V	
1	A Nest in the City Many people call New York City home. So does a famous bird. He's a red-tailed hawk called Pale Male. Pale Male has a hooked beak and a red tail. He got his name because his chest is almost white. Red-tailed hawks need to live where they can hunt for food.										
2	At first, Pale Male chose to live in Central Park. It is a big green park right in the middle of New York City.										
Subtotal											

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Part One: Oral Reading *continued*

Sources of Information Used

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Page	Text	E	SC	E			SC			
				M	S	V	M	S	V	
2 cont.	<p>The hawk started to make a nest in a tree. But some blue jays flew at him. They would not leave him alone.</p> <p>So Pale Male moved. He found a mate and he made a nest on the ledge of a fancy apartment building across from the park. The ledge had sharp spikes on it. The spikes held up the nest of sticks.</p> <p>Baby Birds</p> <p>Before long, there were eggs in the nest. Many bird watchers came with binoculars to see the hawk family.</p>									
Subtotal										

Sources of Information Used

Page	Text	E	SC	E			SC			
				M	S	V	M	S	V	
3	<p>Soon the eggs hatched. Baby birds poked their heads up, and the people cheered!</p> <p>Pale Male has now raised about two dozen chicks. He and his families are famous around the world. People have written many news stories and a book about them. Pale Male was even on two TV shows!</p>									
Subtotal										
Total										
 End Time ____ min. ____ sec.										

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Accuracy Rate	Errors	13	11-12	9-10	6-7	4-5	1-3	0
	%	Below 95%	95%	96%	97%	98%	99%	100%

Self-Corrections	_____
------------------	-------

Fluency Score	0 1 2 3	Fluency Scoring Key 0 Reads primarily word-by-word with occasional but infrequent or inappropriate phrasing; no smooth or expressive interpretation, irregular pausing, and no attention to author's meaning or punctuation; no stress or inappropriate stress, and slow rate. 1 Reads primarily in two-word phrases with some three- and four-word groups and some word-by-word reading; almost no smooth, expressive interpretation or pausing guided by author's meaning and punctuation; almost no stress or inappropriate stress, with slow rate most of the time. 2 Reads primarily in three- or four-word phrase groups; some smooth, expressive interpretation and pausing guided by author's meaning and punctuation; mostly appropriate stress and rate with some slowdowns. 3 Reads primarily in larger, meaningful phrases or word groups; mostly smooth, expressive interpretation and pausing guided by author's meaning and punctuation; appropriate stress and rate with only a few slowdowns.

Reading Rate (Optional)	End Time	___ min. ___ sec.
	Start Time	___ min. ___ sec.
	Total Time	___ min. ___ sec.
	Total Seconds	___
	(RW × 60) ÷ Total Seconds = Words Per Minute (WPM)	
	12,840 ÷ _____ = _____ WPM	

Part Two: Comprehension Conversation

Have a conversation with the student, noting the key understandings the student expresses. Use prompts as needed to stimulate discussion of understandings the student does not express. It is not necessary to use every prompt for each book. Score for evidence of all understandings expressed—with or without a prompt. Circle the number in the score column that reflects the level of understanding demonstrated.

Teacher: Talk about what you learned in this book.

Comprehension Scoring Key

- 0 Reflects **unsatisfactory** understanding of the text. Either does not respond or talks off the topic.
- 1 Reflects **limited** understanding of the text. Mentions a few facts or ideas but does not express the important information or ideas.
- 2 Reflects **satisfactory** understanding of the text. Includes important information and ideas but neglects other key understandings.
- 3 Reflects **excellent** understanding of the text. Includes almost all important information and main ideas.

Key Understandings	Prompts	Score
<p>Within the Text</p> <p>Summarizes the story, including 3–4 important facts in sequence, such as: A hawk built a nest on a building in New York; he raised baby birds; people liked to watch them; some people didn't like so many people watching the building; they took the nest down; people made them put the nest back.</p> <p>The drawing on page 4 shows that the tall buildings are just across from the park.</p> <p><i>Note any additional understandings:</i></p>	<p>Explain what happened in this story.</p> <p>What was the problem?</p> <p>What else happened?</p> <p>What happened at the end?</p> <p><i>Text Feature Probe:</i> Tell what you learned from the drawing on page 4.</p>	0 1 2 3
<p>Beyond the Text</p> <p>Hawks usually live in the country, but Pale Male built his nest in the city.</p> <p>Pale Male built his nest on the building because it was near the park but safe.</p> <p>People liked to watch Pale Male and his babies because they do not get to see hawks in the city (or other reason consistent with the text).</p> <p>The nest was removed because people in the building didn't like being watched all the time with binoculars.</p> <p>Some people liked Pale Male and his nest and some people did not like him.</p> <p><i>Note any additional understandings:</i></p>	<p>What was unusual about Pale Male's nest in this true story?</p> <p>Why did Pale Male build his nest on the building?</p> <p>Why did people like to watch the hawks so much?</p> <p>Why did some people want the nest taken down?</p> <p>What was the disagreement different people had about Pale Male?</p>	0 1 2 3

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A Sample Comprehension Conversation—*City Hawks*—Level M

Teacher — Student Interaction	Teacher Scoring
<p>Invites conversation</p> <p>T: Talk about what happened in the story.</p> <p>S: There was a hawk. I think his name was Pale Male. He couldn't find a place to build his nest in the country, so he went to a big apartment building and built a nest.</p> <p>Probes further.</p> <p>T: What else?</p> <p>S: He wasn't supposed to have a nest on the building and they took it down—or the stuff it was on, they took it down.</p> <p>Probes further.</p> <p>T: Then what happened?</p> <p>S: They got mad—the people who liked the hawks—and so they had to put it up again.</p> <p>Asks for information about the end.</p> <p>T: And what happened at the end?</p> <p>S: He gets to stay there and build a nest and have baby hawks.</p> <p>Asks for interpretation of a graphic.</p> <p>T: Tell what you learned from the drawing on page 4.</p> <p>S: You can see here that the building is right next to the park, so that's how he found it.</p>	<p>Within the Text</p> <p>0 1 2 ③</p>
<p>Asks for inference.</p> <p>T: Why did some people want the nest taken down?</p> <p>S: They were maybe scared because all those people were looking at them with binoculars. They were really looking at the hawks but also the people who lived there.</p> <p>Asks for inference.</p> <p>T: I wonder why they wanted to look at Pale Male and his babies.</p> <p>S: They don't get to see baby birds because normally he would build the nest in the country. So it was neat to see them.</p> <p>Asks for comparison.</p> <p>T: So, what were the two different sides in the argument—the two ways different people felt about Pale Male?</p> <p>S: Some people liked him and wanted him to stay so they could watch him, but people who lived there didn't want the nest so the crowds would go away.</p> <p>Probes further.</p> <p>T: Anything else?</p> <p>S: Some people like birds but some people don't.</p>	<p>Beyond the Text</p> <p>0 1 2 ③</p>

FIGURE 2.17 Sample comprehension conversation, *City Hawks*, level M

APPENNDIX C
SAMPLE COMPREHENSION OBSERVATION FORM

Sample Student
Comprehension form

reads w/ phrasings + fluency, = oral
language

STUDENT COMPREHENSION OBSERVATION FORM
TEXT LEVEL P

Student name: Sinead Date: 12 Feb Teacher observing: (mm)

THINKING WITHIN THE TEXT

- Remembers a series of events from the story, including the setting, problem and solution
- Process long sections of text- multiple lines on a page, long sentences, parenthetical material, etc
- Process complex dialogue, assigned and unassigned
- Sustain attention to a text read over several days, remembering details, revising interpretations as new details are encountered.
- Respond to plot tension or suspense by reading on to seek resolutions
- Search for new information in graphics, diagrams, illustrations etc

✓ literal today

Example of student understanding or confusion:

She was a conductor b/c
lord slaves how to escape.
she had a weapon...?

THINKING BEYOND THE TEXT


- Makes a wide range of predictions, using text structure, personal experience, and knowledge of similar texts to predict outcome
- Predict what characters will do based on traits revealed by the writer or the character's actions
- Make predictions based on illustrations in graphic texts
- Interpret characters and events that are not within the reader's experience
- Synthesise new and known information over a longer text
- Express changes in ideas or knowledge after reading a text and say why, supporting answer with evidence
- Use knowledge from one text to help in understanding diverse cultures and settings in new texts
- Demonstrate learning new content from reading
- Infer cause and effect in influencing characters' feelings or underlying motives
- Generate or react to alternative understandings of the text
- Infer the big ideas or themes and connect them to the current world
- Take perspectives that may be unfamiliar in interpreting characters' motives or themes

IN CASE she needed
to defend herself

Based on (Fountas and Pinnell 2011)

APPENDIX D

GRADE LEVEL/PROGRESS MONITORING CHART



INSTRUCTIONAL LEVEL EXPECTATIONS FOR READING

	Beginning of Year (Aug.-Sept.)	1st Interval of Year (Nov.-Dec.)	2nd Interval of Year (Feb.-Mar.)	End of Year (May-June)
Grade K	C+	D+	E+	
	B	C	D / E	
	A	B	C	
				Below C
Grade 1	E+	G+	I+	K+
	D / E	F	H	J / K
	C	E	G	I
	Below C	Below E	Below G	Below I
Grade 2	K+	L+	M+	N+
	J / K	K	L	M / N
	I	J	K	L
	Below I	Below J	Below K	Below L
Grade 3	N+	O+	P+	Q+
	M / N	N	O	P / Q
	L	M	N	O
	Below L	Below M	Below N	Below O
Grade 4	Q+	R+	S+	T+
	P / Q	Q	R	S / T
	O	P	Q	R
	Below O	Below P	Below Q	Below R
Grade 5	T+	U+	V+	W+
	S / T	T	U	V / W
	R	S	T	U
	Below R	Below S	Below T	Below U
Grade 6	W+	X+	Y+	Z
	V / W	W	X	Y
	U	V	W	X
	Below U	Below V	Below W	Below X
Grade 7	Z	Z	Z+	Z+
	Y	Y	Z	Z
	X	X	Y	Y
	Below X	Below X	Below Y	Below Y
Grade 8+	Z+	Z+	Z+	Z+
	Z	Z	Z	Z
	Y	Y	Y	Y
	Below Y	Below Y	Below Y	Below Y

KEY

Exceeds Expectations


Meets Expectations

Approaches Expectations:
Needs Short-Term Intervention

Does Not Meet Expectations:
Needs Intensive Intervention

The Instructional Level Expectations for Reading chart is intended to provide general guidelines for grade-level goals, which should be adjusted based on school/district requirements and professional teacher judgement.

08/07/2014



DEDICATED TO TEACHERS

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APPENDIX E
SAMPLE FIELD NOTE

Excellent conversation
Flaw

FRI 19 Mind / mind
boarded / board
wind / wind

SWBAT - tell why author wrote 1st chapter

Patrick ~~was~~ silent

Jane - corrects the boys
@ times -

Whole Group
prefers
white on
black

Niau, "She was actually
born a slave!"

Brian Can I add to that
wondered us to know she was v popular for getting
Slaves at

all but B,
listen

Declan - was a good person
to let all the slaves free

↳ links to history

Bibliography
vs
Biography

APPENDIX F

SAMPLE RUNNING RECORD

2/12 Sample Running Records

RUNNING RECORD SHEET
 Name: Shane Date: _____ D. of B.: _____ Age: _____ yrs _____ mths _____ days
 School: _____ Recorder: _____

Text Titles	Errors Running Words	Error Ratio	Accuracy Rate	Self-correction Ratio
Easy _____	1: _____	_____ %	1: _____	_____ %
Instructional _____	1: _____	_____ %	1: _____	_____ %
Hard _____	1: _____	_____ %	1: _____	_____ %

Directional movement _____

Analysis of Errors and Self-corrections
 Information used or neglected [Meaning (M), Structure or Syntax (S), Visual (V)]

Easy _____

Instructional _____

Hard _____

16 correct times
 punct @ times
 punct that periods
 impacts meaning

Cross-checking on information (Note that this behaviour changes over time)

Page	Title	Count		Analysis of Errors and Self-corrections	
		E	SC	Information used	
				E MSV	SC MSV
57	✓ p ✓ v ✓ v ✓ v ✓ B3 ✓ ✓ safety ✓ v ✓ p ✓ v ✓ p safety ✓ v ✓ v ✓ v ✓ v ✓ ✓ v ✓ v ✓ p ✓ closet ✓ closet. ✓ v ✓ v ✓ v ✓ ✓ v ✓ v ✓ p ✓ v ✓ B3 ✓ p ✓ v ✓ v ✓ v ✓ v ✓ ✓ v ✓ v ✓ v ✓ v ✓ ✓ p ✓ v ✓ p ✓ v ✓ v ✓ v ✓ ✓ v ✓ v ✓ v ✓ v ✓ p	1	1		

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APPENDIX G
SAMPLE FAMILY SURVEY

Drian Family survey

Dear [REDACTED]

My name is Mrs. Monica Marino, and I am a Reading Specialist here at [REDACTED] elementary School. I read with your child, and as you know, I am conducting doctoral research surrounding the differences in reading comprehension when children read on an electronic book like a Kindle and when they read a printed book.

I have been asking the students their opinions and getting some interesting responses, but I am interested to know what you have been hearing at home. If you could answer the following questions and return this paper to school, I would appreciate it very much.

1. What does your student tell you about our small group reading lessons?
He says it is fun. He likes the kindle
2. Does your child read a Kindle or paper books with me at school?
Yes Kindle
3. Does your child read a Kindle or paper books at home?
 - a. If your child reads paper books, where do you get them- bookstore, school library, public library, gifts, etc?
paper books from the library
also he reads on the iPad.
4. Have you seen any increased interest in reading at home since January?
He has been reading with more ease and sounding out words better
5. Do you own a Kindle or an iPad at home?
iPad.
6. Have you let your child read books on the Kindle/iPad or other app?
Yes - Razz kids

Encuesta familiar

Querido [REDACTED]

Mi nombre es Mrs. Monica Marino, y soy especialista de lectura aquí en [REDACTED] Elementary School. Leí con su hijo y, como usted sabe, estoy llevando a cabo una investigación doctoral sobre las diferencias en la comprensión lectora cuando los niños leen en un libro electrónico como un Kindle y cuando leen un libro impreso.

He estado preguntando a los estudiantes sus opiniones y obteniendo algunas respuestas interesantes, pero me interesa saber qué has estado escuchando en casa. Si pudiera responder las siguientes preguntas y devolver este documento a la escuela, lo apreciaría muchísimo.

¿Qué le dice su estudiante sobre nuestras lecciones de lectura en grupos pequeños?

¿Su hijo lee un Kindle o libros en papel conmigo en la escuela?

¿Lee su hijo un Kindle o libros en papel en casa?

Si su hijo lee libros en papel, ¿dónde los obtiene, librería, biblioteca de la escuela, biblioteca pública, regalos, etc.?

¿Has visto un aumento en el interés por leer en casa desde enero?

¿Tienes un Kindle o un iPad en casa?

¿Ha dejado que su hijo lea libros en el Kindle / iPad u otra aplicación?

7. Has your child asked to buy books on a Kindle or iPad recently or borrow them from the library?

No

a. Have you been able to do that?

N/A

i. If so, what book(s) did you buy/ borrow from the library?

8. Do you notice any difference in his or her reading at home since January?

He seems to be able to read more fluently

9. Is there anything else you want to share about your student's reading behaviors? Please feel free to email me at [REDACTED] or call me on my personal cell phone [REDACTED] or write your thoughts below.

Thank you. Brian has always loved reading and I feel that you have helped with his ease to read fluently. He sounds out words with less struggle.

Thank you for taking the time to answer these questions. I hope your student is enjoying his/her time reading with me, and have a wonderful February vacation.

Best regards,
Mrs. Monica Marino
Reading Specialist, [REDACTED]

¿Ha pedido su hijo comprar libros en un Kindle o iPad recientemente o los ha pedido prestados de la biblioteca?

¿Has podido hacer eso?

Si es así, ¿qué libro (s) compró / tomó prestado de la biblioteca?

¿Notó alguna diferencia en su lectura en casa desde enero?

¿Hay algo más que quieras compartir sobre los comportamientos de lectura de tu hijo? Por favor, siéntase libre de enviarme un correo electrónico a [REDACTED] llámeme a mi teléfono celular personal al [REDACTED] o escriba sus pensamientos a continuación.

Gracias por tomarse el tiempo para responder estas preguntas. Espero que su hijo esté disfrutando de su tiempo leyendo conmigo y que tenga unas maravillosas vacaciones de febrero.

Atentamente,
Sra. Monica Marino
Especialista de Lectura, [REDACTED]

APPENDIX H

SAMPLE STUDENT SEMI-STRUCTURED INTERVIEW

2/16/15

Date: _____
Student name: Alanna
Interviewer: Monica Marino
Semi-structured interview

Sample Student Interview
Neil Armstrong

Student Group _____
Text level _____
Paper _____ Electronic

Fiction: _____

1. Talk about what happened in this story.

Nonfiction

a. What was the topic of the book you read?
astronauts + space

2. Tell me about XYZ character. Can you describe him using example from the text?

b. Can you talk about the main idea and some details?
Neil + him wanting to go to space, he went to space. Went to moon, got rocks, couldn't see fam/friends for 3 wks

3. What was the conflict in this story?

c. What text features did you find in the book that helped you read it?
Pictures... words

4. Did you enjoy reading this book? Why or why not?
Yeah - It's interesting & I like history

Student Interview

Pg. 2

@home I have books I got
e book fair.

5. Is it similar to the things you read in your classroom? At home? In the library? ^{Sometimes} I read Peter Pan
Sometimes. I read this book on my own called Anne Frank it was
good

a. For E-book users only

i. Was reading this book on the e-book any different than reading paper

books in your classroom setting?
Yes. It's a screen, you flip instead of well you can't
flip them

ii. Do you read books at home in paper or electronically?

paper

iii. Do you have a preference for reading a paper book or an e-book? Why?

paper bec you can bring it places, not
worry about breaking it

iv. Do you think reading on the e-book is easier or harder than reading a
paper book? Why? Can you give an example?

umm easier bec if you tap on a word it gives
you the def. what it means

v. What are some of the tools you like using on the e-book?

vi. Why do you choose the font and colour you choose on the e-book?

sepia bec it's a nice colour

APPENDIX I
GLOSSARY OF ACRONYMS

SAMR- Substitution, Augmentation, Modification, Redefinition

PARCC-Partnership for Assessment of Readiness for College and Careers

BAS- Benchmark Assessment System

CSR-Collaborative Strategic Reading

DRA-Developmental Reading Assessment

DRP-Degrees of Power ®

