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STUDENT LEARNING, CHILDHOOD & VOICES | RESEARCH ARTICLE

E-readers and the effects on students' reading motivation, attitude and comprehension during guided reading

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Abstract: This quasi-experimental mixed methods study examined the use of e-readers during guided reading instruction and its impact on 5th grade students' reading motivation, attitude toward reading, and reading comprehension. For 10 weeks, 19 students received guided reading instruction by means of the traditional paper/text format, while 16 students received guided reading instruction by means of e-readers using the same stories but in digital text format. The Motivation to Read Profile was used to measure student motivation, the Elementary Reading Attitude Survey was administered to measure student attitude and the Gates-MacGinitie Reading Tests, Fourth Edition, were administered to measure student comprehension. A MANOVA showed no significant difference between the students who used e-reader digital text format and those that used paper/text format in regard to reading motivation, attitude toward reading or reading comprehension. However, the qualitative data gave several insights into why e-readers did not make a difference.

Subjects: Classroom Practice; Study of ODL and eLearning; Teaching & Learning

Keywords: e-readers; guided reading; student voices; comprehension

1. Introduction
Many teachers are faced with the challenge of providing reading instruction to students who have little or no motivation to read (Pitcher et al., 2007). There are many reasons why students lack

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PUBLIC INTEREST STATEMENT
Today's students are digital natives. This means that they have been raised with access to a variety of technology and have spent many hours using such devices as computers, video games, digital music players, iPads, e-readers, and cell phones. Many articles have been published that state our students learn differently than those students of the past. Therefore, we investigated 5th grade students' attitude, motivation, and reading comprehension while using guided reading practices with and without e-readers. We were surprised at the findings, as they did not support our hypothesis created because the students are digital natives and we expected to find a big difference between the two groups of students. However, there was no significant difference on reading motivation, attitude toward reading or reading comprehension between the two groups of students. The qualitative information helped us to understand this phenomenon.

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motivation. There are some students who can read, but lack the desire to read and there are some students who lack the motivation to read because they are reading below grade level (Pitcher et al., 2007). This lack of motivation to read grows as students' progress through school (Guthrie & Wigfield, 2000) and impacts a students' self-esteem and behavior (Morgan & Fuchs, 2007). In addition, research has found that some students who were once motivated to read begin to view reading negatively as they enter grade 4 through high school (Guthrie & Wigfield, 2000).

Twenty-first century students are surrounded by technology that brings the world to their fingertips and many have been surrounded by technology since they were babies (Derene, 2013). Consequently, it is important for classroom teachers to integrate technology into their daily lessons, as students were more likely to be engaged in classroom activities when technology was used in the classroom (Derene, 2013). Thus, technology integration into daily reading instruction has the potential to change the attitudes of unmotivated readers (Intel Corporation, 2012; Maynard, 2010).

Due to technological advancements, reading books can now be done on a computer or on an e-reading device. E-readers allow students to read text on a hand held device. The use of e-readers allows the readers and teachers to select text with the touch of a button, to enlarge the text fonts if needed, to watch the pictures that are animated, and in some circumstances, the book can be read aloud to the e-reader.

2. Purpose of the study

The purpose of this mixed methods quasi-experimental study was to determine if there was a significant difference in 5th grade students' motivation to read, attitude toward reading, and reading comprehension achievement between students participating in an intervention that implemented e-readers during guided reading instruction and students without e-readers during guided reading instruction. The study was led by the following research questions:

(1) What is the difference in students' reading motivation between those using e-readers and those students not using e-readers during guided reading instruction?

(2) What is the difference in students' attitudes toward reading between those using e-readers and those students not using e-readers during guided reading instruction?

(3) What is the difference in students' reading comprehension between those using e-readers and those students not using e-readers during guided reading instruction?

(4) What can we learn from fifth grade students' about their attitudes and motivation toward reading based upon small group reading instruction?

3. Literature review

The literature review offers a critical objective summary of past research to build awareness on topics that relate to this study. Thus, the three topics that relate to this study include the theoretical framework, guided reading, and e-readers.

3.1. Theoretical foundations

This study is positioned within several theories. First, the transactional theory of reader response (Rosenblatt, 1978) supports the idea that readers understand or "make sense" of their reading based upon their personal experiences. Every time a person reads, there is a transaction between the reader, the text, and the context. Second, the motivation theory pushes students toward the desire to learn and students who are motivated want to succeed (Gutherie, Wigfield, Metsala, & Cox, 1999). Reading motivation is correlated with how much time a child reads (Morrow, 1992). Children that read more, tend to be better readers, perform better on standardized testing, and develop into lifelong readers (Wang & Guthrie, 2004). Third, the engagement theory of reading examines what makes a student be either an engaged reader or a disengaged reader (Tracey & Morrow, 2006). Students who are engaged readers are intrinsically motivated to read and use metacognitive strategies to monitor their understanding while they are reading.

3.2. Guided reading

Guided reading was the context of this study. Guided reading was first introduced in primary class-rooms to help beginning readers continue to develop as readers (Saunders-Smith, 2009). Guided reading allows students to interact with the teacher and the text in a small instructional group setting. The teacher works with a group of students who read texts on their instructional or developmental levels (Fountas & Pinnell, 1996). The focus during guided reading is on enabling and empowering the child to become a successful reader by showing them which strategies to select so that meaning is gained and maintained during reading and beyond (Mooney, 1990; Szabo, 2006). Guided reading helps develop readers by:

- Giving students the opportunity to develop as readers in a social supported setting.
- Observing individuals as they process new texts.
- Giving the readers the opportunity to develop reading strategies so that they can read increasingly difficult texts independently.
- Giving children enjoyable, successful experiences for reading for meaning.
- Developing children's reading abilities to be successful for independent reading.
- Teaching children how to introduce text to themselves (Fountas & Pinnell, 1996).

There is not enough time in the day to work with students individually, so guided reading is a flexible option (Atwell, 1998). Groups are determined based upon the needs of the students and change as the needs of the students' change. The teacher's role during guided reading is to support students during their interaction with the text. The introduction of the text is key in order to build foundational knowledge necessary for the students to be successful during guided reading (Fountas & Pinnell, 2001). The introduction should be built around a conversation between the teacher and the students. When developing the introduction, the teacher thinks about the reading process, specifics of the texts, and the student's needs that are participating in the guided reading group (Fountas & Pinnell, 2001).

3.3. E-readers

E-readers were the intervention in this study. The definition of text has expanded over the years; speech, communication, a conversation, a radio program, a TV advertisement, text messaging, a photo in a newspaper, and so on can be considered text (Larson, 2008).

Students' daily lives outside of school are affected by technology and students want technology in their classrooms (Derene, 2013). Thus, literacy instruction in the classroom should incorporate our student's lives outside of the classroom to make learning meaningful. Digital devices are a relevant part of our student's daily lives. Therefore, reading instruction has the opportunity to become more relevant to our students by integrating guided reading with e-readers (Larson, 2008). Reading motivation has been shown to be higher after children interact with multimodal texts, especially among children with reading difficulties (Larson, 2010).

4. Methods

4.1. Setting

This study took place in a suburban elementary school in north Texas. The school comprised kindergarten through sixth grade with a total of 753 students. The district reports on socioeconomics and ethnicity showed the make-up of the total student body was: African-American (3%); American-Indian (1%); Asian (2%); Caucasian, (86%); Hispanic (8%); and economically disadvantaged (8%).

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4.2. Participants

The 50 fifth-grade participants attended a suburban elementary school in north Texas. However, only the data from the 35 students who returned signed parental consent and gave assent were used in the study.

The school principal assured the researcher that every attempt was made to make classes as comparable as possible. The previous year's teachers worked with the principal to develop class lists that had equal numbers of students that were considered to have high, medium, and low academic levels. They also attempted to equally divide the special education students and the gifted students, as well as those with behavior problem. The control and intervention classrooms had the same teacher, as she taught in a block format and had three different sections daily. Two of the sections were randomly chosen by the principal for the study.

4.3. Data analysis

The researcher collected quantitative data from three instruments and were chosen because of their reliability and validity as well as their appropriateness to use with students. The qualitative data were provided by having student's answer13 interview questions.

4.3.1. Quantitative data collection

The quantitative data were collected using two Likert-scale surveys: Elementary Reading Attitude Survey (ERAS), (McKenna & Kear, 1990), and the Motivation to Read Profile (MRP) survey (Gambrell, Palmer, Codling, & Mazzoni, 1996). Reading comprehension data were collected from the Gates-MacGinitie Reading Tests, Fourth Edition (GMRT), (MacGinitie, MacGinitie, Maria, & Dreyer, 2000).

4.3.1.1. Elementary reading attitude survey. The Elementary Reading Attitude Survey (ERAS, McKenna & Kear, 1990) is a teacher-administered survey that can be given to students in a whole class situation and is used to measure students attitudes toward recreational reading (items 1–10) and academic reading (items 11–20). It consists of 20 items that encourage students to think about how they feel about reading both independently and as part of larger groups. Students respond to each item by circling one of four facial expressions ranging from four very happy (strongly agree) to one very unhappy (strongly disagree).

McKenna and Kear (1990) normed the ERAS using 18,138 students in Grades 1–6 from 95 US school districts across the country. They determined that the Cronbach's alpha, which measures the internal consistency of attitude scales, ranging from .74 to .89. In addition, McKenna and Kear (1990) investigated construct validity on the two subscales: Recreational reading and academic reading. More information about this process of validating the instrument can be read in their article.

For this study, we felt the total score would be a better predictor. Thus, the recreational reading and academic reading subscales were grouped together and the total scores were used for data analysis.

4.3.1.2. Motivation to read profile. The MRP survey was created and normed by Gambrell et al. (1996). The MRP was chosen because it was not only appropriate for fifth-grade students but it had both quantitative and qualitative components. The survey is made up of 20 items and uses a 4-point Likert scale. The raw score from the self-concept questions and the raw score from the value of reading questions is added together to get a full survey raw score. The highest full survey raw score is an 80.

Gambrell et al. (1996) field tested the MRP survey to gain more information about reliability and validity. Cronbach's alpha was calculated to determine internal consistency and revealed a moderately high reliability (self-concept as a reader .75; value of reading .82). Validity was determined by taking responses from the survey and conversational interviews were looked at for consistency of information across the two instruments. More information about this process of validating the instrument can be read in their article.

4.3.1.3. Gate-MacGinitie reading tests. The GMRT, (MacGinitie et al., 2000) was administered to the whole class to determine students' general level of reading achievement. This test was given to students as a measure of their reading comprehension using grade equivalent scores. Test GMRT reliability indicate strong total test and subtest internal consistency levels with coefficient values at .90 for the total tests and the subtests at all levels. Form S-Vocabulary .88 and Comprehension .89 and Form T-Vocabulary .89 and Comprehension .89 test reliability (MacGinitie et al., 2000). More information about this process of validating the instrument can be read in their article.

4.3.2. Qualitative data collection
The qualitative data came from the interview questions found on the MRP. Comments made during the interviews were analyzed to determine if students provided any confirming evidence about their self-perceived competence in reading. There was an inter-rater agreement of .87 and it was found that 70% of the information from the interviews tapped in into the survey questions.

(1) The MRP interview questions were used to gain insight into the student's reading motivation in an informal conversational manner (Gambrell et al., 1996). Teachers may need to ask students to elaborate on responses and to extend, modify, and adapt the 14 questions. For this study, the researcher chose only to use the questions from part C on the general reading section (questions 1–8) of the MRP interview questions because this section focused on students' general reading behaviors. Questions 9–13 came about during the conversational interviews to gain a deeper insight into the use of the e-readers during guided reading instruction. Baker (1984) points out that even though interviews are scripted, deviations from the scripted questions are expected to gain more information from the interview participants. See Appendix A for the semi-structured interviews.

4.4. Student interview data analysis
The data were collected and audio recorded. The researcher transcribed the audio-recorded interviews. The transcribed interviews were analyzed using the constant comparative method (Strauss & Corbin, 1998) by open, axial, and selective coding.

Open coding of the data involves the process by which concepts are identified and their properties and dimensions are discovered. This process involves breaking down the data into discrete parts and closely examining each part. Hypotheses are then drawn which allow for the explanation of the concepts found in the data (Strauss & Corbin, 1998). Axial coding, as defined by Strauss and Corbin (1998) is "the process of relating categories to their subcategories". Axial coding reassembles the data that were broken down into discrete parts during open coding (Strauss & Corbin, 1998). It was during the selective coding process that the central categories emerged and formed (Strauss & Corbin, 1998). The central categories emerged from the existing categories or were made up of the existing categories. A peer reviewer confirmed coding and development of themes.

4.5. Procedure
Students in both the control group and the intervention group were given pretests on the ERAS, MRP, and GMRT. Guided reading groups were formed based upon the multiple-choice reading comprehension questions from the GMRT (Form S). The guided reading groups contained 5–6 students in each group. The classroom teacher then provided guided reading lessons for 20 min two times a week over a 10-week period. The guided reading lessons were developed around texts that were available in either a traditional paper format or a digital format. Each lesson focused on various comprehension strategies. After the 10-week period, post-tests were given using the ERAS, MRP, and GMRT (Form T).

Interviews were then conducted with five students from both the control group and intervention group that showed gains in attitude and comprehension. At the time of the interviews, one of the students from the intervention group was absent, so only four students were interviewed.

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5. Results

5.1. Quantitative component

Means and standard deviations for each measure were calculated (Table 1), as well as gain scores, computed by subtracting the pretest scores from the post-test scores. The independent variable was the use of the e-readers and the dependent variables were the gains from pretest to post-test in motivation to read, attitude toward reading, and reading comprehension. The Box Test indicated that the assumption of homogeneity of variance-covariance matrices was not violated ($p = .109$). Levene's Tests indicated that the assumption of equality of variance was not violated; indicating that both groups had equal variances on the three variables.

A MANOVA was run to see if the differences in scores on the three instruments were significant. The MANOVA for the effect of e-readers compared to the use of traditional text was not significant [Wilks' $\lambda = .868$, $F (3, 31) = 1.569$, $p = .217$, $\eta^2 = .132$]. Between-subjects effects found that the mean gain score for Attitude toward Reading showed a significant difference (Table 2). The control group that used traditional text had a positive gain, while those that used e-reader had a negative gain. The differences in gain scores for reading motivation ($p = .980$) and reading comprehension ($p = .588$) were not significant.

5.1.1. Research question 1

To answer research question #1, what is the difference in students' reading motivation between those using e-readers and those students not using e-readers during guided reading instruction, the results from the MRP were used. On the motivation survey, the e-reader intervention group participants' scores were relatively the same from the pretest ($M = 60.3$; $SD = 5.8$) to the post-test ($M = 60.9$; $SD = 6.7$). For the control group participants, the mean scores increased from pretest ($M = 53.6$; $SD = 6.3$) to post-test ($M = 55.2$; $SD = 6.3$). The gain scores were calculated for each instrument by subtracting the post-test from the pretest scores. The e-reader participants had a very slight positive gain, while the traditional text group had a slightly higher positive gain in motivation to read. However, the MANOVA procedure found that this difference was not significant ($p = .980$).

5.1.2. Research question 2

To answer research question #2, what is the difference in students' attitudes toward reading between those using e-readers and those students not using e-readers during guided reading instruction, the data from the ERAS were used. On the attitude survey, the e-reader intervention group participants had a decrease in their mean scores from the pretest ($M = 57.5$; $SD = 8.8$) to the post-test ($M = 56.1$; $SD = 10.5$). For the control group participants, the mean scores increased from pretest ($M = 47.3$; $SD = 11.2$) to post-test ($M = 52.1$; $SD = 11.6$). The e-reader participants had a negative gain, while the traditional text group had a positive gain in attitude toward reading. The MANOVA procedure found that the difference was statistically significant ($p = .046$).

5.1.3. Research question 3

To answer research question #3, what is the difference in students' reading comprehension between those using e-readers and those students not using e-readers during guided reading instruction, the Gates-MacGinite was used. The e-reader intervention group participants' comprehension scores were slightly higher from the pretest ($M = 6.4$; $SD = 3.4$) to the post-test ($M = 7.0$; $SD = 2.8$). Control group participants also scored slightly higher from pretest ($M = 6.1$; $SD = 2.9$) to post-test ($M = 6.7$; $SD = 2.5$). Both e-reader and traditional text participants had a very slight positive gain in reading comprehension. However, the MANOVA procedure found that the difference in gains were not statistically significant ($p = .588$).

5.2. Qualitative component

The open-ended questions on the Motivation to Read Attitude Survey were used for student interviews. Students were selected to participate in the semi-structured interviews by examining their scores to determine which students had gained in both motivation and comprehension scores from

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Table 1. Means and standard deviations for e-readers and traditional text						
Instruments	**Pretest**		**Posttest**		**Gains**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
e-Reader						
Reading motivation	60.3	5.8	60.9	6.7	0.6	4.1
Attitude toward reading	57.5	8.8	56.1	10.5	−1.4	8.6
Reading comprehension	6.4	3.4	7.0	2.8	0.6	2.1
Traditional text						
Reading motivation	53.6	6.3	55.2	6.3	1.6	5.9
Attitude toward reading	47.3	11.2	52.1	11.6	4.8	9.0
Reading comprehension	6.1	2.9	6.7	2.5	0.6	1.3

Table 2. Between-subjects effects for gain scores on reading assessments by reading instruction type						
Source	**SS**	**df**	**MS**	**F**	**p**	**η^2**
Reading motivation gain	.002	1	.002	.001	.980	.000
Attitude toward reading gain	335.7	1	335.7	4.300	.046*	.115
Reading comprehension gain	.002	1	.002	0.299	.588	009.

*Significant at $p < .05$.

pre- to post-test. Ten students were selected, however, due to student absence, only four students were from the e-reader intervention group and five students were selected from the traditional text control group. These data were used to answer research question #4,What can we learn from fifth grade students about their attitudes and motivation toward reading based upon small group reading instruction?

5.2.1. Themes
By examining the narrative responses gained from the nine participants during the interviews, three overarching themes emerged to describe their experiences with guided reading using e-readers or traditional text. Excerpts from interview data are recorded below to support the themes, which included:

(1) small group instruction.
(2) technology challenges.
(3) meaningful or structured formatting of the texts.

5.2.2. Small group instruction
Small group instruction theme emerged from the comments from the nine students during their interviews with the researcher. During guided reading, small groups of students are grouped at their instructional level. This small group instruction occurs when the teacher works with 4–5 students at their instructional reading level:

• I like it when it is a small group because she [teacher] can see every one of us [students] and can answer every one of our questions.
• I like it better when I am with the teacher because she teachers me more. If I am in a big group and someone raises their hand, she can't tell because she is reading the book to everyone. She is not just paying attention to that one person but to the whole class.
• I have been a better reader in the small group.

- It (working in a small group with the teacher) would help me with reading and help me comprehend stuff and the teacher would help us if we didn't understand a word. She would stop and tell us what that word was if we didn't tell her.
- I think it is better that way because when you are in a bigger group and I would be talking to my friends and then there is a quiz the next day and you are like oh my god, I wasn't paying attention. I think it is better in a little group to pay attention and to focus.
- Yes, I really liked small groups and not just working with partners all the time. Sometimes it can get a little crazy. With the teacher organizing it, it feels better.
- The small groups help me understand more. When we read together, it helps me understand.
- I pay better attention to things when I am with the teacher because whenever we are all in a big group, she doesn't focus on specifically you, so you can't learn as much because she is focusing on more people.
- Normally if I was reading it, I would just scan it and turn the page. I really get it now.
- I was more focused in the small group because she was right there in front of me.

5.2.3. Technology challenges
Technology can help teachers provide an enriched classroom experience, but it can also provide challenges that can interfere with the learning experience. Technology can be a positive in the classroom, but this study found that technology can also be a hindrance in the classroom. This theme emerged from the comments the four students gave during their interviews with the researcher who were in the intervention group and used the e-reader during guided reading instruction:

- It would freeze on us.
- Harder to get connected and the buttons were hard to use.
- The screen was small, so it was hard to read. I would have preferred to use the iPad.
- I would want an iPad because it is bigger.
- We wasted time trying to get the e-readers to co-operate.

5.2.4. Meaningful text structures
Meaningful texts were important to students in both the digital e-reader group and the paper traditional group. This theme emerged from the comments all nine students had given during their interviews with the researcher:

- I liked that the pictures were in color.
- I like how there were different fonts and colors.
- I like stuff that is colored and it makes it more fun to read it. It makes it stand out to me.
- The pictures and text help me understand, I was like wow.
- The pictures made me visualize it, you know, how it looked if you were reading about it and you want to see something that you are reading. You visualized when you are reading about it, but is nice to see it when you are reading.
- It is bright and in your face, so I concentrated more and I wasn't off topic. You don't get bored of it. You keep reading, reading, and reading. You don't get tired of reading it and you don't want to stop reading the book.
- I like the magazines because I have learned stuff form them that I didn't know.
- The different colors and little quotes help me understand.
- I liked them because it made me know about things that were happening.

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The fourth research question examined what can be learned from fifth grade students about their attitudes and motivation toward reading based upon small group reading instruction. First, the comments showed that the nine students who were interviewed felt that small group instruction and meaningful texts were factors that created a more meaningful context and content for reading instruction. Second, the four students who were interviewed discussed how the e-readers caused some challenges that interfered with their guided reading lessons. The students felt that the technology got in the way of their reading and they would have liked to have had traditional text as an alternative when the technology was not working properly. In addition, the size of the e-readers was noted to be a problem, as the student's expressed they would have liked a bigger screen that is available on other e-readers or iPads. Third, both the control group students and the intervention group students talked about the reading text used during guided reading. All students felt that the text features (colorful pages, real pictures, quotes, and real-world topics) made the guided reading sessions more fun and they were more motivated to read. Fourth, the format of guided reading in a small group was also viewed to increase their motivation and attitude to read by the students control and intervention. The relationship of the teacher with the students was important to the students during the guided reading lessons. Students commented that they felt they paid better attention to what the teacher was discussing and that the teacher paid more attention to them in the small group setting. In addition, asking questions was easier to do in small groups in comparison to being in a whole group setting.

6. Conclusion

"Effective eLearning comes from using information communications technology (ICT)-to broaden educational opportunities and help students develop the skills [it is thought] students will need to thrive in the 21st century and has been shown to have positive effects on student learning" (Intel Corporation, 2012, p. 1). However, this study also supports other studies that have shown the human touch is also important in the learning process (Kolowich, 2010; Monke, 2010; Perry, 2003; Richardson, 2013). So, even though this was a small study and is not generalizable, it does add to the body of research that supports the positive impact the teacher's relationship with the student has on learning.

The results lend support to both sides of the issue of using technology in the classroom. It was found that the digital text can be a motivating factor in increasing student engagement which leads to higher achievement (Schlechty, 2002), but it can also be a roadblock to instruction when it is not working properly, as talked about in the result section.

In addition, the relationship between the teacher and the students played an important role in the learning process and the implementation of the guided reading groups. The students wanted to be "noticed" and affirmed by their teacher. Students want their teachers to know them and acknowledge them, not just as a student in their classroom, but as a person with needs and dreams.

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Appendix A:

Qualitative Interview Questions

(1) Did you reading anything at home yesterday? what?

(2) Do you have any books that you are reading at home?

(3) Tell me about your favorite author.

(4) What do you think you have to learn to be a better reader?

(5) Do you know about any books right now that you'd like to read? Tell me about them.

(6) How did you find out about these books?

(7) What are some things that get you really excited about reading books?

(8) Who gets you really interested and excited about reading books? Tell me more about what they do.

(9) What was it like using the Nooks in reading class?

(10) When you were pulled to do guided reading with the teacher, how did you feel about reading those texts?

(11) How did you feel about the subject matter of the texts?

(12) What were your feelings about having guided reading groups with your teacher?

(13) When you did the guided reading with your teacher, how did that compare to whole class reading instruction?