The Effect of Visualization Intervention on Sixth-Grade Special Education Students' Reading

Comprehension

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Table of Contents

List of Tables

Abstract

The purpose of this study was to examine the effects of visualization reading instruction on the reading comprehension of sixth-grade special education students with reading difficulties. The null hypothesis predicted no significant relationship between visualization reading instruction and special education sixth-grade students' reading comprehension. The study's quasi-experimental design used the Performance Series Computer-Adaptive Reading Test as both a pre- and post-test to measure reading comprehension. Visualization instruction using students' instructional-level texts was administered twice weekly for 25 minutes over an eight-week period. The results of the study failed to reject the null hypothesis that there is no significant relationship between the struggling readers' comprehension and visualization instruction, but suggested that there is room for further research about visualization and other reading strategy instruction to investigate what is most beneficial to readers who have difficulty accessing grade-level text. Additional research would benefit from a larger and more diverse sample and an extended research period.

CHAPTER I

INTRODUCTION

Overview

Though reading comprehension is the main focus and end goal of quality reading instruction at all levels, from phonemic awareness to vocabulary instruction, it is increasingly a concern for middle school-aged and older students. The 2015 National Assessment of Educational Progress results indicate that 63% of eighth-grade students nationwide perform below proficiency level in reading (Maryland State Department of Education, 2016). Even higher in Maryland and for special education students in Maryland—67% and 87% respectively—the percentage of students below proficiency on national reading tests is a grave problem for students and educators alike (Maryland State Department of Education, 2016). Students eligible for the National School Lunch Program are 81% below proficiency in reading (Maryland State Department of Education, 2016). Success in reading can determine success in all other contents and is a crucial life skill. Educators must attend to the gaping disparities in reading success for all students, especially students with disabilities and disadvantaged, impoverished students.

Research shows that reading comprehension can be taught by explicitly instructing students to practice the instinctive habits of effective readers. One of many key reading habits is visualization, the ability to create a mental image representative of the text. When visualization is used as a tool alongside other reading strategies, readers can comprehend with more success. Students with disabilities or with limited experiences often have limited verbal language, vocabulary, and imaging skills. Explicit visualization instruction and repeated practice with creating images during reading and verbalizing the images reinforces the visualization skills and may improve reading comprehension. Visualization instruction aids students in developing a

wider vocabulary and imagination capacity to associate with reading. With increased vocabulary and imaging proficiency, students have more tools with which to comprehend and express their comprehension of a text.

The researcher teaches sixth-grade English Language Arts in Anne Arundel County and works with special education students with reading goals and other students who are lacking in reading proficiency. In the sixth-grade English Language Arts class, the students meet in small guided reading groups to read instructional level text with the intention to increase fluency and comprehension. One of many strategies the students use is visualization. With this study, the researcher placed more emphasis on visualization with one group to investigate its impact on the reading comprehension of selected special education students.

Statement of Problem

This study will examine the relationship between visualization instruction and reading comprehension. The researcher intends to investigate the impact of explicit, small-group visualization instruction on the reading comprehension of special education students with reading goals.

Hypothesis

There is no significant relationship between visualization reading instruction and reading comprehension.

Operational Definitions

The independent variable in this study is the small-group visualization instruction. The visualization instruction occurred twice weekly for 25-minute periods in a small guided reading group of six students.

The dependent variable in this study is the selected students' gains on the Performance Series Assessment in Reading during treatment.

CHAPTER II

REVIEW OF THE LITERATURE

This literature review seeks to explore the impact of focused visualization literacy

instruction on reading comprehension. Section one focuses on the need for innovation in literacy

instruction for grade school children while section two addresses the presence of visualization

among various other reading strategies. Section three discusses the interconnectedness between

visualization and other common reading strategies. Section four elaborates on the specific

benefits visualization has to reading comprehension and section five provides a summary of the

literature.

The Need for Literacy Instruction Innovation

Reading difficulties among American students are becoming increasingly problematic for

schools to address. Rader (2010) notes:

> Many students have difficulties with reading. On the 2003 National Assessment for
> Educational Progress (NAEP) Test, 37% of fourth-grade students and 26% of eighth-
> grade students fell below basic for reading (National Center for Education Statistics,
> 2003). This result indicates that one third to one fourth of U.S. students do not have
> adequate basic reading skills. Because reading is a salient part of life success, it is
> imperative that schools try alternative methods of teaching (p. 126).

With so many students falling behind in reading skills, American educators must be innovative,

professionally developed, and willing to implement research-based practices to improve reading

instruction. Visualization, imaging, or attending to the author's imagery is a proven best practice

for improving comprehension. Without explicit teacher instruction, some students may not be

creating images of what they read in their minds (McTigue, 2010). When students are faced with

challenging, rigorous text above their reading levels without extra supports, much of their energy

is spent on simply decoding the words. There may be limited capacity to do thinking beyond the

text, such as visualizing and comprehending more subtle, nuanced, figurative or technical language.

Also, research suggests that visualization creates an opportunity for readers to own their understandings about text, rather than be told by an instructor what is correct. McTigue (2010) argues, "Teachers should not own the correct answers to questions about text-based imagery; by contrast; students should be encouraged to express their divergent views and images" (p. 54). This builds competence and confidence among struggling readers with a history of poor experiences with reading.

Visualization as a Reading Habit

Visualizing is a regular, natural habit for most good readers. "For mature, skilled readers, visualizing… seems out of place in a list of comprehension strategies. 'That's just what you *do* when you read!' the skilled reader might think…" (Liang & Galda, 2010, p. 331-332). Many unskilled readers do not visualize inherently and need direct instruction. Especially with increasing levels of visual stimuli that children interact with every day from television, film, games, and picture books, children are challenged less often to devise visualizations on their own (Liang & Galda, 2010). Liang & Galda (2010) continue to argue that visualizing is easier and more useful when an image has not already been created for the student, it can help students understand complicated poetic language, and they will be able to generalize the visualizing strategies used with one text and continue to apply it in response to a variety of media.

In order for visualizing to be effective as a regular practice, it must become a habit through regular practice. Moving beyond single-word and short-phrase images to a whole sentence or paragraph can be difficult and should be practiced (De Koning & van der Schoot, 2013).

Researchers have identified habits of good readers and proven that good reading habits can be explicitly taught to readers of all levels.

> Good readers visualize text content. Making mental images of descriptive passages helps readers connect the words on the page to their prior knowledge. This process helps them better understand what they read because they use their prior knowledge to flesh out details not provided by the author (Brown, 2008, p. 538).

Visualization is useful in its connection to both reading and writing, as one researcher evaluated visualization support's effect on writing (Patel & Laud, 2009). The results of the Patel and Laud's study show a strong connection between visualization support for students and additional details in students' story writing. As reading and writing are tightly intertwined, increased writing skills with imagery will build imaging skills while reading.

Visualization's Interconnectedness with Other Reading Strategies

Visualizing and predicting are two common strategies among many that are taught to help readers access instructional level text. Teaching reading strategies together rather than in isolation is important because students must learn how to use reading strategies in a flexible, resourceful manner, rather than using a strategy simply because they were instructed to do so (Styslinger, Ware, Bell, & Barrett, 2014). Reading strategy instruction should also include application to a variety of texts.

It is key that strategies are taught together and used to initiate "meaning-oriented discussions" (Brown, 2008, p. 539). Brown also notes that teacher-dominated discussion is more likely at first, but the responsibility for strategy use should be given to students as quickly as possible to ensure success.

Finally, Kitano and Lewis (2007) draw attention to the importance of using a variety of reading strategies, each of which have varying levels of cognitive demands on students. The researchers note that reading fluency alone increases as it relates to tutoring time spent decoding,

visualizing, determining importance, and synthesis of content. Research makes the connection between increased fluency and increased reading comprehension.

Teaching Visualization and its Benefits to Comprehension

The review of the literature indicates that visualization is a valuable tool for all readers, but especially struggling readers who are not using it instinctively. Liang and Galda (2010) note, "Teaching visualization must be intensive to be effective, but it is a powerful skill to know and use" (p. 331). Liang and Galda also argue that this skill is valuable when readers encounter both expository and narrative, aesthetic texts.

When readers are able to connect their background knowledge about the world as it applies to a text they read with a visualization or image of the text, the resulting "coherent and richly connected visuospatial representation of the situations and events" enables readers to think beyond the text, make inferences, and approach deeper comprehension of the text they read (De Koning & van der Schoot, 2013, p. 262). Combining the strategies of predicting, activating background knowledge, and visualizing is a salient way to improve reading comprehension with students who are falling behind. Teachers may do this by modeling and explaining the use of various reading strategies in tandem with each other, but also by showing readers a picture about the text so they have a starting point (De Koning & van der Schoot, 2013).

Imagery creation is also a possibility for assessment of individuals who may struggle with traditional paper-and-pencil tests. Jeanne (2016) argues that using a self-report instrument that uses imagery could enable students to express their understanding in an accurate way (p. 27).

As the research demonstrates, students who are at risk for reading failure need imagery instruction to be successful. Rader (2010) argues that inner reflection and visualization is a powerful tool for an underserved and struggling population.

> The positive and potentially long-lasting effects of cultivating visualization skills, especially when linked to oral language development, cannot be overlooked. The visualization and oral language process is a powerful tool that can enable all students to have successful academic experiences across all curriculum areas (Rader, 2010, p. 130).

Leopold and Leutner (2015) confirm that visualization is a key tool for critical, active thinkers and readers: "…this visualizing strategy facilitates the organization and integration functions of active information processing" (p. 332). The research proves that readers with poor comprehension skills have potential to learn reading strategies and create a habit of using them with quality instruction. Because visualizing and strategy use does not always come naturally to these students, Rader (2010) suggests that students practice retelling with teacher guidance so that readers can learn to create an organized, personal reading of the text that includes all key points; retelling and visualizing will aid in this process.

Summary

The research clearly suggests a need for innovation in reading comprehension instruction for students who are not reading and comprehending successfully at the appropriate grade level. Much of the research also directs reading instructors to look to visualization as a means to improve comprehension, the end goal of all reading instruction.

CHAPTER III

METHODS

The purpose of this study was to investigate the relationship between visualization instruction and the reading comprehension of sixth-grade special education students.

Design

The study used a quasi-experimental design to examine the impact of visualization instruction on the reading comprehension of special education students with reading goals. Sixth-grade special education students in both the control and experimental groups completed the Performance Series Assessment in Reading in October and again in April. Participants in both groups received small-group instruction according to the Anne Arundel County Public Schools guided reading curriculum, while participants in the experimental group received focused instruction in visualization for eight weeks. The results of the pre- and post-test were analyzed to investigate a possible relationship between visualization instruction and reading comprehension.

Participants

The participants in this study attend a public middle school in northern Anne Arundel County, Maryland. The school is the employment site of the researcher. The participants in the study were the researcher's sixth-grade special education students in the co-taught classroom setting that employed the guided reading model of instruction.

The sample population included a convenience sample of 6 special education students, including three girls and three boys. The sample is 33% African-American, 33% Caucasian, 17% Hispanic, and 17% Multi-racial. Both the control and experimental groups consisted of three students.

Instruments

This study used the Performance Series Computer Adaptive Internet Assessment in Reading to analyze reading performance in the fall and spring of the same school year. This particular test is used in Anne Arundel County Public Schools to ascertain the progress that special educations students make within the school year. Unlike other tests, Performance Series aims to measure students' actual knowledge rather than their ability to respond to a grade-level test (Scantron Corporation, 2015, p. 2).

The Performance Series test results are provided in a variety of formats, including useful scaled scores, gains reporting, grade level estimates, and linked Lexile® measures.

The computer-adaptive test produces an approximate one-hour customized test that adjusts its questions based on students' responses. Students respond to multiple choice questions about passages; the passages and questions provided are based on the students' performance and the series of questions and passages is unique to each student.

Reviews of the Performance Series Computer Adaptive Internet Assessment in Reading mention that it is a reliable and valid instrument that is easily administered and not taxing on the students who take it. Some benefits include: "alignment with a large number of standards, ability to provide a number of very useful reports in real time for immediate curriculum decisions, ease of administration, adaptation to students' functioning to provide close assessment of skill achievement, and the provision of suggested learning objectives" (Henington & Morse, 2006, p. 3). Additionally, the Reading assessment provides units of performance in the following areas: Reading-Vocabulary, Fiction, Nonfiction, and Long Passage; this enables instructors to focus on particular areas of strength and need.

One area of concern was the test's reliance on multiple-choice questions and no use of elaborated responses to ascertain students' academic knowledge and growth. It may be argued that an assessment with solely multiple choice questions is inauthentic and not a true measure of a student's ability. However, one benefit of the multiple-choice assessment is that it is able to immediately respond and adapt to students' performance—changing the next reading and question set based on previous performance or ending the test altogether in cases of inattentive, careless guessing.

Procedure

The quasi-experimental design of the study included a pre-test for both experimental and control groups and a post-test after the intervention period. The pre- and post-tests consisted of the computer-directed Performance Series Computer Adaptive Internet Assessment in Reading. Under the supervision of the researcher, the six study participants completed the tests independently online without any assistance or accommodations.

Over the span of eight weeks, the control group received small-group reading instruction on a variety of standards and strategies using instructional level texts. During this time, the experimental group received focused instruction in visualization. This consisted of practice in verbalizing detailed descriptions of provided illustrations, including images the researcher selected to support background knowledge for the text to be read. After the participants practiced verbalizing the images provided, the researcher modeled visualizing from a small portion of the text. The students then applied the skill by reading instructional level text and recording five or more descriptive details from the assigned reading. Finally, the researcher asked the group to elaborate on the images in their head by asking guiding questions to expand the depth of the

image. The researcher repeated this procedure twice weekly with the experimental group using

the instructional level text suggested by the curriculum.

The purpose of this study was to observe the impact of visualization reading strategies on the comprehension of struggling middle school readers. The null hypothesis that visualization reading strategy instruction does not have a statistically significant relationship with reading comprehension was supported by the data.

Table 1

Fall and Spring Scaled Scores

	Average Group Increase in Scaled Score	Standard Deviation	Median
Experimental Group	195	168	187
Control Group	64	26	60

Table 2

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The medians of Gain are the same across categories of Group.	Independent-Samples Median Test	1.000[1,2]	Retain the null hypothesis.
2	The distributions of Gain is the same across categories of Group.	Independent-Samples Mann-Whitney U Test	.700[1]	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

[1]Exact significance is displayed in this test.

[2]Fisher Exact Sig.

The average gains in reading comprehension were 195 for the treatment group and 64 for the control group. The median significance test above demonstrates that the gains in reading comprehension were not statistically significant at 0.05 level even though with a median gain of

187 from the experimental group and 60 from the control group. With a level of significance at

.05, both significance tests resulted in values not within the region of rejection—1.00 and .70.

Table 3

Individual Scaled Scores

Student	Scaled Score Fall 2016	Scaled Score Spring 2017	Increase in Scaled Score	Percent Increase in Scaled Score
Group 1: Experimental Group				
Student A	2301	2333	32	1%
Student B	2445	2632	187	8%
Student C	1987	2354	367	18%
Group 2: Control Group				
Student D	1808	1868	60	3%
Student E	1882	1974	92	5%
Student F	2012	2052	40	2%

Table 4

Individual Grade Level Equivalents

Student	Grade Level Equivalent Fall 2016	Grade Level Equivalent Spring 2017
Group 1: Experimental Group		
Student A	3.1	3.3
Student B	3.4	4.9
Student C	<2.0	3.4
Group 2: Control Group		
Student D	<2.0	<2.0
Student E	<2.0	<2.0
Student F	<2.0	2.0

Individual scores demonstrate slight to moderate gains in reading comprehension over the

course of the school year for students in both the experimental and control groups.

CHAPTER V

DISCUSSION

The results of this study failed to reject the null hypothesis stating that there was no statistically significant relationship between visualization reading instruction and reading comprehension. All six students among two small groups made some gains in reading comprehension from Fall 2016 to Spring 2017. While students in the experimental group receiving the visualization reading strategy instruction intervention made more gains than those in the control group, the gains were not statistically significant as shown by the median significance test. The sample size of six students is very small; therefore, the median significance test is more likely to fail to reject the null hypothesis.

Although the null hypothesis was not disproven, the experimental group receiving the visualization intervention did make greater gains than the control group. The control group tested at lower levels in general in the fall of 2016—all below a grade level equivalent of 2.0. This could possibly indicate that those students in the control group needed even more comprehension support than those in the experimental group. However, Student C of the experimental group scored a similar grade level equivalent of <2.0 and made the most significant gains from fall 2016 to spring 2017. This comparison may indicate potential for further research in focused, intensive reading strategy instruction for students who are significantly below grade level as these students were in sixth grade.

In the experimental group, the researcher noted an increased ability in the students' ability to verbalize the imagery developed while they read, especially with guiding questions. The students elaborated on the images they developed from the text and explained their own interpretations of the text and inferential information, such as conflict, theme, or character traits.

Further, they summarized and wrote about the texts with more proficiency. The visualization instruction appeared to deepen their connections to the texts so that they could internalize them, making them their own.

Implications of Results

The gains that students made suggest that small-group reading instruction is valuable in and of itself for struggling readers or students with reading disabilities. Though the experimental group that focused largely on visualization made more gains than the control group, it does not strongly prove that visualization taught in isolation is more beneficial than reading strategies taught together.

The research demonstrates that a variety of reading strategies are important for students to use and practice regularly. More important than focusing on a single reading strategy is the ability to employ the strategies often enough so that students may begin to use them seamlessly with each other without laborious effort.

Threats to Validity

Maturation is a threat to internal validity as the students would be expected to make gains in reading comprehension over the sixth-grade school year with reading activities in most of their classes. In classes other than Language Arts, students generally read text above their instructional level and are often read to as a result. In Language Arts, there is more focus on each student's instructional level with the implementation of small reading groups and a new curriculum.

Also, the limited sample size of special education students in the researcher's class is a threat to the external validity. The study is less generalizable because it involves only six

intentionally-selected special education students. Results of the study would not be applicable to the general population unless further research was done with a more varied, random sample.

Implications for Further Research

Additional research in reading strategy instruction is important, especially as it relates to struggling readers who may attain a sense of learned helplessness as they reach an age when they know they are different from others. Further research is needed to determine whether focus and mastery of one reading strategy is more beneficial than teaching multiple strategies at a time.

Further research might also expand and randomize the sample to make the implications of the results more generalizable. Finally, a study like this would benefit from a longitudinal approach that measures students' progress over time and assesses whether struggling readers retain and use reading strategies regularly as good readers do. Such a study could shed additional light on how much reinforcement, repetition, and reminders struggling readers need to use learned strategies when they are reading at their instructional level. Especially insightful would be tracking a sample of students from elementary school onward to determine their retention of reading strategies and their growth in reading comprehension.

Finally, more research could be conducted on a variety of reading strategies taught in isolation and in tandem with students of various reading levels. Especially interesting would be the potential for research with students with similar degrees of reading difficulties, based on grade level equivalents and instructional reading levels. For example, the students in the control group were scoring at a grade level equivalent of <2.0 and in the sixth grade. It would be intriguing to notice whether there would be a relationship between intensive visualization instruction and reading comprehension for students who have reading comprehension scores and instructional reading levels significantly below their current grade level. It would be of similar

interest to investigate the same variables as they relate to age as students progress to high school with significant reading difficulties.

Conclusion

The results of the study failed to reject the null hypothesis that there is no significant relationship between visualization reading strategy instruction and reading comprehension. More research with larger sample sizes is necessary to disprove the null hypothesis and support the focused instruction of visualization reading strategies.

Though the research failed to reject the null hypothesis, there is much potential for further research in the area of struggling readers and what strategies and approaches are best practices for reading instruction.

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