The Effect of Graphic Organizers on Comprehension of Secondary Students

by

Donna Norris

Submitted in Partial Fulfillment of the Requirements for the

Degree of Master of Education

December 2019

Graduate Programs in Education

Goucher College
# Table of Contents

List of Tables................................................................................................................... i

Abstract.............................................................................................................................. ii

I. Introduction...................................................................................................................... 1
   Statement of Problem........................................................................................................ 5
   Hypothesis........................................................................................................................ 5
   Operational Definitions................................................................................................... 5

II. Review of the Literature............................................................................................... 6
   Reading Comprehension................................................................................................... 6
   Reading Comprehension and Secondary Students......................................................... 7
   Using Graphic Organizers to Improve Comprehension.................................................. 7
   Summary........................................................................................................................... 8

III. Methods....................................................................................................................... 9
   Design............................................................................................................................... 9
   Subjects............................................................................................................................ 9
   Instrument...................................................................................................................... 10
   Procedure....................................................................................................................... 11

IV. Results....................................................................................................................... 12

V. Discussion.................................................................................................................... 13
   Results............................................................................................................................. 13
   Implications.................................................................................................................... 13
   Threats to Validity.......................................................................................................... 14
   Links to Previous Literature Studies............................................................................. 15
List of Tables

1. Pre and Post Test Reading Scores for High School Students Receiving Graphic Organizer Instruction................................................................. 12
Abstract

The purpose of this study was to examine the effectiveness of graphic organizers as a motivating strategy to increase reading comprehension of high school students. The measurement tool used was the Fountas and Pinnell Benchmark Assessment. This study involved use of a quasi-experimental design using a pre- and post-test. The application of graphic organizers during reading instruction did not significantly impact high school students’ comprehension skills. Research in this area should continue as there is very little information available regarding using graphic organizers to impact comprehension of high school students.
CHAPTER I
INTRODUCTION

Most educators would agree that there are many interpretations of what the term reading comprehension means. It seems that every year more and more educational and psychological research is published that define what reading comprehension is, why many students have significant problems with reading comprehension, and what can be done to help middle and high school students who are struggling.

An all-inclusive definition of reading comprehension is a process in which readers construct meaning by interacting with text through the combination of prior knowledge and previous experience, information in the text, and the stance the reader takes in relationship to the text (Pardo, 2004). To put it simply, reading comprehension is the ability to read, understand, process, and recall what was just read.

Reading is a critical ability that impacts students' performance across all other core academic subject areas. Many adolescents are not prepared for the reading-to-learn demands inherent in secondary school curricula and become vulnerable to poor academic outcomes that include repeating a grade, dropping out and expulsion (Finn & Zimmer, 2012, Reschly, 2010).

In a 2008 statement paper entitled “Reach Higher, America Overcoming Crisis in the U.S. Workforce,” the National Commission on Adult Literacy concluded that low literacy levels increase the likelihood of school dropout and have been associated with long-term negative life consequences (National Commission on Adult Literacy, 2008).

Reading comprehension is important because a student’s academic progress is profoundly shaped by the ability to understand what is read.
Students who cannot understand what they read are not likely to acquire the skills necessary to participate in the 21st century workforce (Butler, Urrutia, Buenger, and Hunt, 2010).

Developing strong reading comprehension skills is essential for a productive academic, professional, and personal life. In the current academic world of high stakes testing, the need for secondary students to be able to navigate through content area materials is critical. In the 2012 IRA position paper on Adolescent Literacy, the IRA states that “the 21st century has brought with it a tremendous evolution in how adolescents engage with text. As adolescents prepare to become productive citizens, they must be able to comprehend and construct information using print and non-print materials in fixed and virtual platforms across various disciplines.” (pg. 2, 2012).

When students struggle to read, reading becomes non-motivating and students avoid reading. Reading comprehension is hindered when students lose interest and disengage from reading (Guthrie, 2008). Many students begin to dislike reading because they struggle to gain meaning from what they read. While research supports a strong correlation between reading engagement and reading ability, students often do not read well because they do not spend time reading. A cycle of reading apathy begins, which makes it more challenging to support struggling readers (Bohn-Gettler & Rapp, 2011; Katzir, Lesaux, & Kim, 2009).

Just as educators and researchers vary on the definition of reading comprehension, they also have different ideas and insights as to what the best reading interventions are for teachers to use with struggling readers in different core content areas. Recent research indicates that adolescents need more explicit instruction with literacy strategies based on reading the kinds of challenging texts they will encounter in middle and high school. Adolescents often need more
sophisticated and specific kinds of literacy support for reading in content-areas, or academic disciplines (Lee and Spratley, 2012).

There are many reading strategies that can be used across all content areas. Most reading strategies fall into three categories; before reading, during reading and after reading.

**Before Reading Strategies**

Before reading strategies are used to activate prior knowledge, build background knowledge and prepare the student for reading. An anticipation guide is also a good tool to use to activate prior knowledge. These guides can be set up in various ways depending on what the teacher wants the student to know about the text. Anticipation guides can also be used as an after reading strategy. The K-W-L chart is a graphic where students identify what they already know (K), what they want to know (W) and after reading what they have learned (L). The K and W sections are used before reading, and the L section is used once the student has read the text.

**During Reading Strategies**

During reading strategies are strategies that students can use as they read the text. Highlighting important details, circling unfamiliar words, and underlining or highlighting the who, what, when, where and why, on the page being read, keeps the student engaged in the reading. Having the student make annotations about what they are reading helps the student to stay engaged with the text and write down ideas or questions as they read. Annotations can be used to pose questions, mark main ideas, and make predictions. A reading guide is a strategy that help students navigate reading material when the text is especially difficult or technical. When students use a reading guide, they respond to a teacher-created written guide of prompts as they read the text. Reading Guides help students to comprehend the main points of the reading and understand the organizational structure of a text.
After Reading Strategies

After reading strategies give students an opportunity to summarize, question, reflect, discuss, and respond to text. Exit tickets give students the opportunity to write responses to questions posed by the teacher at the end of class. Exit Slips help students reflect on what they have learned and express what or how they are thinking about the new information. The QAR (Question-Answer Relationship) teaches students how to decipher what types of questions they are being asked and where to find the answers to them. Summarizing teaches students how to take a large selection of text and reduce it to the main points and key details. Summarizing lessens a student’s confusion by allowing the focus to be on key words and phrases of a text that are worth noting and remembering.

Graphic Organizers

Another strategy which teachers can implement is the use of graphic organizers to help with reading comprehension. They can be used before, during, or after reading. The organizers themselves are not content specific and can be used for reading comprehension in all content areas. A working definition of a graphic organizer would be a spatial display of text information that can be given to students as study aids to accompany texts and communicate both vertical, hierarchical concept relations and horizontal, coordinate concept relations (Katayama, Robinson, Devaney, and Dubois, 1997).

Graphic organizers are a unique strategy tool because they can be used with all different kinds of texts, although they may differ from each other in appearance and design depending on what type of information the student needs to extract from the text. Graphic organizers are believed to promote higher order thinking because students are required to classify information,
establish relationships, and draw inferences as they read and discuss the text (Armbruster, Anderson & Ostertag, 1987).

**Statement of the Problem**

The purpose of this study was to examine the effectiveness of graphic organizers as a motivating strategy to increase reading comprehension of high-school students.

**Hypothesis**

The null hypothesis is that the reading comprehension scores on the Fountas & Pinnell spring benchmark test of the students who use graphic organizers will not differ significantly from the baseline reading comprehension scores on the winter benchmark tests.

**Operational Definitions**

For the purposes of this study, reading comprehension is defined as the student performance on the Fountas & Pinnell Benchmark Assessment (BAS2, 2nd Edition). The calculation of the score is determined by the student’s oral responses which cover the main idea, important details, vocabulary in context, and inference. Questions are assessed after the student reads the text aloud and silently. Texts are leveled and defined as fiction or non-fiction.

The definition of a graphic organizer is a drawing that employ lines, circles, and/or boxes to form images that visually organize information in a hierarchy which can portray cause and effect, compare and contrast information, and/or align information in a recurring or linear sequence (Ellis & Howard, 2007). Graphic organizers provide a framework for students to create a visual representation of the most significant information in a text, which enhances comprehension (DiCecco & Gleason, 2002; Kim, Vaughn, Wanzek, & Wei, 2004; Manoli & Papadopoulou, 2012; Vaughn & Edmonds, 2006). For the purposes of this study, students will use a graphic organizer to write the topic, a main idea, three important details and a summary.
CHAPTER II

REVIEW OF THE LITERATURE

This literature review seeks to explore the problem of reading comprehension of expository texts at the secondary high school level. Section one will provide an overview of reading comprehension and why it is a critical skill. In section two, problems of reading comprehension of expository and non-fiction texts for secondary students will be discussed. Section three will discuss the use of graphic organizers to improve reading comprehension of texts for high school students.

Reading Comprehension

The definition of reading comprehension is the basic ability to read a text, process the information, and understand what was just read. Reading comprehension is both a skill and a function of intelligence. Put simply, reading comprehension is the process of making meaning from text (Wooley, 2011). Reading and understanding (comprehension) involves the interaction of several processes covering knowledge and ability, decoding, sentence structure, and other cognitive processes (Hudson, 1996). Reading comprehension is a complex process that involves many variables. These variables include general language skills, background knowledge, comprehension strategies, and knowledge of the text and working memory (Babayiğit and Stainthorp, 2011). Reading involves more than letter recognition and phonics. Reading is also determining meaning and context. As a person reads, information is organized into patterns that are recognized. Direct or indirect connections are made between the information from the text. As the information is processed, comprehension is developed.

Comprehension is the reason for reading. If readers can read the words but do not understand what they are reading, they are not really reading.
Reading Comprehension and Secondary Students

Secondary students in the United States face an overwhelming challenge with respect to reading comprehension. Nationally, two-thirds of high school students are unable to read and comprehend complex academic materials, think critically about texts, and synthesize information from multiple sources, or communicate what they have learned (NAEP, 2013).

In 2012, The Common Core State Standards Initiative outlined college and career readiness standards that placed increased emphasis on preparing students to read complex text across a range of content areas. The current problem in secondary classrooms is how to develop the necessary skills to be able to read the texts required of college classes and literacy demanding occupations when fewer than 35% of students in the secondary grades read proficiently (U.S. Department of Education, 2011). Compounding this is the reality that secondary-level courses focus on content where reading skills are mandatory prerequisites and therefore, not an instructional priority (Kennedy & Ihle, 2012).

Using Graphic Organizers to Improve Comprehension

Graphic organizers visually depict interrelationships of superordinate and subordinate ideas, using special arrangements, geometric shapes, lines, and arrows to portray the content structure and to demonstrate key relationships between concepts (Darch, 1986). When students use graphic organizers, it helps them with sorting information, and showing relationships between new and prior information. They help students determine meaning, and manage data quickly and easily before, during, and after reading and discussion. They are useful for reading difficult material, highlighting information, valuing cultural diversity, meeting needs of special populations, and supporting language learning (Gallaran & Kotler, 2007). Using graphic
organizers, especially when reading expository texts, gives students a more visual way to synthesize the information they gather from the text.

Summary

The purpose of this literature review was to define what reading comprehension is, why secondary students struggle with reading comprehension of expository texts and to discuss the use of graphic organizers as a reading comprehension strategy for struggling students. With recent Common Core standards being utilized in classrooms across the country, secondary students continue to struggle to comprehend expository texts across the curriculum. The literature suggests that by utilizing graphic organizers in the classroom, students are more equipped to comprehend what they read, and apply what they have learned.
CHAPTER III

METHODS

The purpose of this study is to examine the effects of using graphic organizers to increase the reading comprehension of high school students.

Design

This study used quasi-experimental pre-test, post-test design. All twenty-five students in the study were given pre and posttests so the researcher could compare their reading comprehension scores before the intervention and determine gains, if any, after the intervention was used.

Subjects

The participants for this study formed a convenience sample of ninth and tenth grade students from four literacy classes at North Point High School in Waldorf, Maryland. The high school is located in Charles County, and has a total population of 1744, of which 59% are African-American, 20% are Caucasian, 6% are Hispanic, 6% Asian, and 7% are two or more races. There are 869 females and 875 males enrolled at North Point. One hundred and fifteen students are special education with IEP’s. That is about 6% of the student population.

Twenty-five students were selected, by the researcher, from the researcher’s ninth and tenth grade literacy classes. Out of the 25 students, thirteen had IEP’s. All thirteen special education students have comprehension reading goals on their IEP’s. The research group contained twenty males, and five females. Eighteen of the students were African-American, three were white, two Hispanic students, one Asian, and one multiracial student. Reading grade equivalents ranged from grade four to grade 7. The students ranged in age from fourteen to sixteen years.
**Instrument**

The Fountas & Pinnell Benchmark Assessment System 2 is a formative reading assessment. The assessment measures decoding, fluency, vocabulary, and comprehension skills for students in third through eighth grade. The test results are used to determine progress of decoding, fluency, vocabulary, and comprehension.

The Fountas & Pinnell Benchmark Assessment System 2 consists of book levels L through Z. Half of the books are fiction; the other half are non-fiction. An intermediate spelling test is initially used for placement at appropriate reading level. Grade level equivalent is determined by aligning the L–Z book levels to the F&P Text Level Gradient™.

The comprehension portion of the assessment is a predetermined set of questions that are divided into three groups: thinking within the text, thinking beyond the text, and thinking about the text. There are two to three questions within each comprehension area. The areas are rated on a scale from 0–3. On the comprehension work up sheets, there is usually a main idea question designed to determine whether the student comprehended and could identify the main theme of the story. There are also fact questions to determine explicit and implicit student reading comprehension. The vocabulary questions determine student understanding of words in context. Inferential questions show the students ability to make connections and utilize prior knowledge.

Once a student’s starting reading level is determined, the student reads the appropriate leveled book. After the student is finished reading, there is a comprehension conversation with the examiner about the book that was read. The examiner asks the questions orally, and the student’s responses are written down. The student can look back at the book for answers if needed, but answers need to be in their own words. If the student gives an incomplete response,
the examiner can prompt them or re-phrase the question. There is no time limit on the comprehension portion of the assessment. The test is administered with an examiner and one student individually.

Procedure

The study began in January 2019, at the beginning of the second semester. Winter benchmarks using the Fountas & Pinnell Benchmark Assessment System 2 were administered to all of the students on an individual basis. The results of the winter assessment served as the baseline for the study. The researcher chose the two ninth and two tenth grade classes to be part of the study.

The next several days were spent teaching the students how to find the main idea of a text with three supporting details. The researcher designed activities to be used with the students about how to find three supporting details and the main idea of a text. The researcher modeled using highlighters to mark up the text in order to find the specific details that would support the main idea. Next, the researcher introduced the graphic organizer and showed the students the correct way to use it. Graphic organizers were used once a week, or one per new text, for twelve weeks. The same graphic organizer was used throughout the study. (Appendix A).

After twelve weeks of using graphic organizers, students were administered the Fountas & Pinnell Benchmark Assessment System 2 as their spring benchmark. Levels were determined by the scores of the winter benchmark assessments. Changes in the individual scores are described in Chapter IV.
CHAPTER IV

RESULTS

This purpose of this study was to determine the effect of using graphic organizers on reading comprehension. The study participants were a convenience sample of high school students from various literacy classes at a Charles County Public High School.

The students’ who participated in this action research project were high school students who were four or more years below grade level in reading. The students received instruction in the use of graphic organizers for reading comprehension from January 2019 to May 2019.

The differences in the Fountas and Pinnell reading scores are presented in Table 1 below.

Table 1: Pre and Post Test Reading Scores for High School Students Receiving Graphic Organizer Instruction

<table>
<thead>
<tr>
<th>Reading Measures</th>
<th>Test</th>
<th>Mean</th>
<th>N</th>
<th>Standard Deviation</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Level</td>
<td>Pre</td>
<td>5.8</td>
<td>30</td>
<td>1.30</td>
<td>2.20</td>
<td>0.03*</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>6.1</td>
<td>30</td>
<td>0.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehension</td>
<td>Pre</td>
<td>5.7</td>
<td>30</td>
<td>1.73</td>
<td>1.23</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>6.1</td>
<td>30</td>
<td>1.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Words Per Minute (WPM)</td>
<td>Pre</td>
<td>117.9</td>
<td>30</td>
<td>17.32</td>
<td>1.24</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>114.4</td>
<td>30</td>
<td>17.30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < 0.05

The null hypothesis that the reading comprehension scores on the Fountas & Pinnell spring benchmark test of the students who use graphic organizers will not differ significantly from the baseline reading comprehension scores on the winter benchmark tests is supported for reading comprehension and words per minute, and rejected for reading level.
CHAPTER V

DISCUSSION

The purpose of this study was to examine the effectiveness of graphic organizers as a motivating strategy to increase reading comprehension of high-school students.

Results

The null hypothesis that the application of graphic organizers during reading instruction does not impact high school students’ reading comprehension skills was rejected for reading levels. The reading levels pre and post test scores were statistically significant. The students in the research group had a mean score of 5.8 for reading levels on the Fountas and Pinnell pretest. After the students received instruction and implemented using graphic organizers, the mean score on the post-test reading levels was 6.1. The results for comprehension mean scores and words per minute scores pre and post-test, were not statistically significant.

Implications

The results of this study show that graphic organizers can be a useful tool to aid in a students’ comprehension of a text, but should not be used as the only intervention for increasing reading comprehension. While the results of this study show a significant difference in the pretest and post test scores for reading level, the results of this research shows that using graphic organizers alone does not have a significant difference on improvement of comprehension. Graphic organizers are one of many tools that a teacher can utilize during literacy instruction.

Although the scores did not show a significant change in comprehension pre to post-test, there was a slight improvement in students’ reading levels and words per minute. Aside from the statistical results, the use of graphic organizers yielded other benefits. When student’s use
graphic organizers, it helps them to write down the important information from the text, and keep it together in an organized way. Graphic organizers can also be used to organize the students’ thoughts and ideas for writing paragraphs and essays. Whether the organizers are produced by the teacher, or student created, students are more motivated to use them for a specific task as opposed to just writing information down on notebook paper. Graphic organizers lend themselves for use with visual and kinesthetic learners.

**Threats to Validity**

In this study, there are factors that can be determined as threats to validity. One factor was the implementation of the Fountas and Pinnell Benchmark Assessment to determine pre-test and post-test comprehension scores. This assessment is widely used across the county, not only in secondary schools, but elementary and middle schools as well. This assessment is designed to be used primarily as a placement tool for Tier 2 and 3 reading interventions. The F&P benchmark assessment not only measures comprehension, but also measures fluency and accuracy. The F&P Benchmark Assessment is more of an ordinal score and does not provide an equal interval scale that is important in data analysis. Use of a different assessment that primarily measures comprehension could have yielded different results.

One factor was that the assumption among the students who participated in the study already had intermittent experience with graphic organizers in previous classes. Although instruction on how to use the graphic organizers was given, it may have been the first time some of the students had used an organizer for comprehension, but not for all students.

Another factor was that the students’ who were used in this research study have had reading difficulties for nine or more years. By high school, these students have very little motivation
when it comes to the reading of any text. Attempting an intervention with these students for a very short period, 5 months, may yield limited results.

Links to Previous Literature Studies

Graphic organizers are widely used across content areas. One of the primary reasons for this is that a visual display helps the student to organize the information in a way that assists with the retention of the content being taught or read. Visual displays of information such as those provided by graphic organizers enhance the reading comprehension of students, possibly by helping them organize the verbal information and thereby improving their recall of it (Ae-Hwa Kim; Vaughn, Sharon; Wanzek, Jeanne; Wei, Shangjin. 2004). After conducting their own research on the effectiveness of graphic organizers these authors go on to say that “With respect to the effectiveness of using graphic organizers across grade levels, our analysis demonstrated effective outcomes at the elementary and secondary levels for the use of graphic organizers. Ae-Hwa Kim; Vaughn, Sharon; Wanzek, Jeanne; Wei, Shangjin et al. (2004).

To support the hypothesis, the use of graphic organizers related to more positive outcomes when the intervention offered a longer duration of instruction and training (Alvermann & Boothby, 1986; Bean, Singer, Sorter, & Frazee, 1986). The results of this research shows that using longer intervention durations may be necessary for students to use graphic organizers more easily and independently. According to other researchers, more research is needed to draw conclusions about the duration and length of treatments needed to positively affect maintenance and transfer effects (Gersten, Fuchs, Williams, Baker, 2001).
Implications for Future Research

If this study was repeated again, the researcher should use a different assessment tool to measure comprehension. Although the Fountas and Pinnell Benchmark Assessment has become a standard assessment tool used in the county for diagnostics and progress purposes, it is not an adequate tool to measure comprehension. The comprehension portion of the F&P Benchmark Assessment System consists of the teacher doing the testing having a conversation with the student about the text, then the teacher determines whether the student has comprehended the text using the F&P criteria for scoring the level of comprehension. Because of the way that the comprehension portion of the test is implemented, it may be difficult to be consistent when rating the student.

Another suggestion for future research would be to design the study so that there are two groups. One group would be given graphic organizers, and the other group would be used as a control group. I think this would yield better results.

As discussed previously, the duration of this study should be longer than five months. A longer time period could yield different results.

Conclusion

The purpose of this study was to examine the effectiveness of graphic organizers as a motivating strategy to increase reading comprehension of high-school students. The results of this study showed that graphic organizers can be a useful tool to aid in a students’ comprehension skills, but should be used with other tools and strategies. The results of this research shows that using graphic organizers alone does not have a significant difference on improvement of comprehension. Although the scores did not show a significant change in
comprehension pre to post-test, there was a slight improvement in students’ reading levels and words per minute.

The null hypothesis that the application of graphic organizers during reading instruction does not impact high school students’ reading comprehension skills is accepted. Based on the results of this study, graphic organizers are a useful tool, but they may be more effective when used with other interventions and a longer period of time.
References:


Appendix A

Name: ________________________      Class ________         Date: ____________

Topic and Main Idea Worksheet

Directions: Write the main idea, details and summary of the given text in the boxes provided.

Topic:

Main Idea:

Detail 1:  

Detail 2:  

Detail 3:  

Summary: