

**QAR and its Effect on the Reading Comprehension Performance of Fourth Grade Students**

**by**

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## **Abstract**

The purpose of this study was to examine the effectiveness of the reading strategy, Question-Answer-Relationship (QAR) in its ability to improve the reading comprehension scores of fourth grade students on the Anne Arundel County Public Schools Reading and Language Arts Benchmark exams. The results of this study indicate that QAR did not have a significant impact on reading achievement. Further research is needed to determine if this strategy would be more beneficial for students with different needs.

# CHAPTER I

## INTRODUCTION

In the United States there is an underlying expectation that 100% of the population be literate. There have been numerous published reports which suggest that when this is not the case, society suffers. To combat literacy problems, school systems employ many reading programs, strategies, and interventions to aid children with reading difficulties so that they can become adequate readers who are capable of functioning within our society as adults. There are numerous reading programs, interventions, and practices currently in use within school systems to help all students become successful and skilled readers. Among these practices is the Question-Answer-Relationship strategy (QAR), which has been shown to improve comprehension and literacy in students.

In current times it is the expectation that all citizens be literate and able to read to function within our technological society. To be employable in the modern economy, citizens are expected to be able to read and interpret challenging material as well as perform sophisticated calculations and solve problems independently. These demands are far greater than those placed upon citizens in the past century. The job market now requires people to be functioning at these high levels of literacy because there are far fewer jobs available for unskilled and semi-skilled workers.

With these increasing demands, educators have expressed growing concern regarding the numbers of students who fail to meet such high standards of literacy and struggle with reading. National longitudinal studies show that more than 17.5 % of the nation's school children (about one million) will encounter reading problems in the first three vital years of their schooling (Jennings, Caldwell, & Lerner, 2006). Such problems can have a long-term, adverse effect upon

a child's educational future. Additional studies suggest that a person who is not a modestly skilled reader by the end of third grade is unlikely to graduate from high school (Snow, Burns, & Griffin, 1998).

The future is bleak for individuals without a high school education. These individuals are more likely to suffer from chronic unemployment and become convicted of crimes. The unemployment rate for non-high school graduates was 26.9% in 2007 (Us Bureau of Labor Statistics, 2008). Studies report nearly 80 % of adult prison inmates are illiterate. Sadly, the cost of illiteracy takes a toll not only on individuals, but on society as well. The cost to tax payers of adult illiteracy is \$224 billion dollars a year in welfare payments, crime, job incompetence, lost taxes, and remedial education. United States companies lose nearly \$40 billion annually due to illiteracy (Jennings et al., 2006). With so much at stake, school systems nationwide need to do whatever it takes to prevent the literacy problems that are afflicting the nation.

Most school systems employ a core reading program to educate students on a daily basis within the general education classroom. However, quite often the core reading program does not meet all of the diverse needs of students. To combat this problem, many school systems create a tiered system of reading instruction to respond to students' needs. Within these tiers are varying levels of reading instruction supports. Tier one consists of the core reading program. Tier two instruction includes reading intervention programs which address the specific needs of each student. Examples of tier two intervention reading programs include Early Reading Intervention, Language for Learning, Spell Read P.A.T., Voyager Passport, Corrective Reading, and Soar to Success. Each of these programs is designed to address different reading problems such as decoding or comprehension. Typically, students are pulled out of the general education classroom to receive this instruction. Tier three interventions provide the most intensive

instruction available and are used only when tiers one and two have proven unsuccessful. These interventions may include programs such as Failure Free Reading and the Wilson Reading System.

Many schools employ the reading intervention programs mentioned above. However due to limited capacity and funds, only the neediest of students are able to participate in such programs. Thus, many disadvantaged students are without the benefit of such interventions. For this reason it is important that educators plan to augment the core reading program in various ways to meet the needs of students. Such augmentations can include providing instruction in a variety of reading strategies within the classroom setting. Strategy instruction has the ability to benefit all students, especially the struggling reader.

A strategy that has been used successfully to improve comprehension is QAR, which stands for Question-Answer-Relationship. Using this strategy, students analyze different comprehension questions to determine where they might find the answers to these types of questions. This strategy demonstrates for students that answers are not always found within the text, but at times require background knowledge to provide an answer. Past studies and research related to QAR, such as that reported by Raphael and Wonnacott, (1985), suggest that the strategy can be quite beneficial for students. In several studies, Raphael and Wonnacott report that students who received QAR instruction outperformed those who did not. This strategy also has been shown to have a positive impact upon average and low ability students (Ezell & Kohler, 1992).

This researcher became interested in examining the impact of reading strategy instruction on the reading performance of struggling readers in her role as a fourth grade classroom teacher. She observed that her students struggled with answering comprehension questions, and wished to

determine if the QAR reading strategy would be beneficial for her students.

### **Statement of Problem**

The purpose of this study was to examine the effect of the reading strategy QAR, on the comprehension level of fourth grade students. The independent variable in this study was the use of QAR in the classroom. The dependent variable was the comprehension scores of the fourth grade participants on a school system benchmark exam.

### **Statement of Hypothesis**

The purpose of this study was to investigate the following research hypotheses:

- 1) There will be no difference in the performance of fourth grade students using QAR and the performance of students not using this strategy as determined by results from performance on the Anne Arundel County Public Schools Reading and Language Arts Benchmark exam.
- 2.) There will also be no difference in the performance of males versus females using QAR and those males versus females who are not using this strategy as determined by the results from performance on the Anne Arundel County Public Schools Reading and Language Arts Benchmark exam.

### **Operational Definitions**

Reading Comprehension: For the purpose of this study, reading comprehension was defined as student performance on the Anne Arundel County Benchmark (Anne Arundel County, 2004) exam.

## **CHAPTER II**

### **A REVIEW OF THE LITERATURE**

This literature review examines reading comprehension and the use of strategy instruction in order to improve students' ability to read and comprehend a variety of texts. Section one defines and describes reading comprehension while section two addresses characteristics of skilled readers and strategies which can improve comprehension. The third section focuses on the strategy QAR. QAR will be defined and explained as will its purpose, origin, and effectiveness in improving comprehension.

#### **Definition of Reading Comprehension**

Comprehension is a complex process of constructing meaning from the text by interacting with it through a combination of prior knowledge, previous experiences, information in the text, and the stance the reader takes in relationship to the text (Pardo, 2004). True comprehension should go beyond a literal understanding of the text and involves the reader's interaction. Readers need to be thoughtful, insightful, and possess the ability to merge their thinking with the text and extend it beyond a superficial understanding. They should be able to think not only about what they are reading but about what they are learning and how it builds upon what they already know in order to develop insight and think more deeply and critically about the topic at hand and the world around them. Good comprehension allows readers to question, interpret, and evaluate what they read so that reading has the ability to build

knowledge, promote understanding, and ultimately change thinking (Harvey & Goudvis, 2000).

Readers vary in the skills, knowledge, cognitive development, culture, purpose, and motivation they bring to a text which in turn can affect comprehension. Students need a variety of skills such as basic language ability, decoding skills, and higher level thinking skills in order to connect to and understand a text. They also need to possess various types of knowledge including background knowledge and content knowledge. Readers need to be able to connect known information to new information to learn and create meaning. In addition, a reader's cognitive development can play a role in his or her ability to comprehend a text by affecting his or her ability to evaluate it in different ways. Culture also may play a part in comprehending texts based on the degree to which the writer and reader match the culture espoused in the text. The purpose for reading also can affect or change the way in which a reader comprehends a particular text. Readers may interpret the meaning of a text slightly differently based upon why they are reading a particular piece of text. Motivation can impact the interest, purpose, emotion, or persistence with which a reader engages with text. More motivated readers will work harder to understand and build meaning from a text by applying a wider variety of strategies while less motivated individuals are not as likely to work as hard and often will not create as powerful a meaning as highly motivated readers (Pardo, 2004).

### **Characteristics of Skilled Readers**

Skilled readers use thinking strategies while reading to help them understand what is being read. They often search for connections between what they know, their previous experiences, emotions, and understandings to the new information they encounter in the texts they read. Connecting what readers know to new information is the core of learning and

understanding. For instance, when reading a narrative text, if readers have had an experience similar to that of a character in a story, they are more likely to understand the character's motives, thoughts, and feelings. In addition, when reading an expository or nonfiction text, if readers have an abundance of knowledge about the specific content area, they will develop a better understanding of the new information which is being presented. Additionally, skilled readers ask questions of themselves, authors they encounter, and the texts they read. They do this before, during, and after reading a text. They also draw inferences during and after reading and distinguish important from less important ideas within the text. Skilled readers are able to synthesize information within and across texts to create meaning. They can monitor the adequacy of their understanding and repair unsound comprehension (Harvey & Goudvis, 2000). In order to correct comprehension difficulties, skilled readers may invent strategies to help them understand and remember what they have read. Yet, most readers do not invent these strategies to mend comprehension on their own; they need to be explicitly taught strategies and cognitive procedures in order to apply them. Children and adults alike can benefit from explicit comprehension strategy instruction (Guthrie, 2003) However, proficient readers are able to adapt strategies to suit their purposes for reading (Harvey & Goudvis, 2000).

The Research and Development (RAND) report, commissioned by the United States Department of Education, describes characteristics of proficient readers. The report states that a proficient reader should be able to read a variety of materials with ease and interest, read for varying purposes, read with comprehension even when the material is neither easy to understand nor intrinsically interesting, acquire new knowledge and understand new information, apply textual information appropriately, and be able to reflect upon what is read (Raphael, Highfield, & Au, 2006)

### *Strategies to improve comprehension*

The National Reading Panel (NRP) from 1997 to 2000 reviewed research concerning reading comprehension instruction and found twelve categories of comprehension instruction that help readers construct meaning as they read and as a result improve comprehension. These research-based strategies invigorate both audio and visual perception, activate memory and semantic processing, enhance perception, engage syntactic knowledge and processing, teach narrative structure, and promote reasoning. The twelve categories of instruction include: active listening, comprehension monitoring, prior knowledge, mental imagery, mnemonics, graphic organizers, vocabulary instruction, question answering, question generation, summarization, and multiple-strategy instruction. NRP noted that teacher preparation for text comprehension as well as cooperative learning by peers can affect student comprehension (Guthrie, 2003).

#### **Question-Answer-Relationship Strategy**

Questioning is a beneficial comprehension strategy for readers to employ because it allows readers to interact easily with the text and evaluate and make connections to it. Studies suggest that questioning is most effective when students are actively involved in this process. Question-Answer-Relationship (QAR) strategy engages students in the questioning process and teaches them that there are different sources to consult to assist with answering questions (Jones & Leahy, 2006). QAR does not classify questions in isolation; rather, it considers the reader's background knowledge and the text. This approach reflects the current concept of reading as an interactive process influenced by characteristics of the reader, the text, and the context within which the reading happens (McIntosh & Draper, 1996).

QAR provides a method of thinking and talking about sources of information for answering questions. Raphael and Wonnacott (1985) found that simply answering

comprehension questions does not lead to improved student performance. Instead, they found that students must engage in high levels of questioning in a highly interactive setting to achieve proficient levels of comprehension. QAR is a strategy which is very interactive and promotes and improves students' comprehension (Raphael & Au, 2005).

### *Types of QAR Questions*

There are two primary information sources within the QAR framework, the text and one's background knowledge. The strategy explicitly teaches children that not all answers are located in the text. Many poor readers are not aware of this and benefit from such instruction. These two basic classifications known as "in the book" and "in my head" can then be broken into four additional categories. Under the in the book classification are "right there" questions and "think and search" questions. Right there questions are very literal and allow students to identify textually explicit information such as definitions and facts. They are located in the text easily and, therefore, readers usually only have to work with small amounts of text in order to answer such questions. Think and search questions ask readers to summarize, explain, compare and contrast information, and identify cause and effect relationships. Readers have to integrate and interpret information. As readers complete these tasks, they must examine the text as a whole (Raphael, Highfield, & Au, 2006).

The other two categories of questions include "author and me" and "on my own." Author and me questions involve the text and readers' past experiences and background knowledge. Students must have read the text and understood it in order to answer such questions. Author and me questions may ask students to form a hypothesis, solve a problem, state what is necessary, evaluate a situation, and make inferences. The last category is on my own. To answer this type of question, readers can rely solely on their own background knowledge. These questions often are

used prior to reading a text to help access background knowledge on a particular topic. This type of question may ask readers to state their opinion or how they would feel about a certain situation or topic. The question may ask students to make a guess or prediction as well (Raphael, Highfield, & Au, 2006).

### *Origin of QAR*

The Question Answer Relationship strategy developed by Raphael in 1985, was adapted from Pearson and Johnson's (1978) taxonomy of questions, as cited in McIntosh and Draper (1996), which includes Textually Explicit, Textually Implicit, and Scriptally Implicit categories. This taxonomy differs from others such as Bloom's taxonomy in that it does not classify questions in isolation but rather by considering the reader's background knowledge and the text. By doing so, it reflects a definition of reading that considers reading to be an interactive and constructive process. The process of reading can be influenced by the characteristics of the reader, the text, and the context within which the reading occurs.

Text Explicit questions have answers located explicitly in the text. Students would not have to engage in inferential thinking in order to answer them. To answer Text Implicit questions students would need to read the text but also engage in inferential thinking using information across sentences and paragraphs. Answers to Script Implicit questions come from the readers' prior knowledge and experiences or their own knowledge base (Swanson & De La Paz, 1998). These categories were originally organized based on cognitive demand and the sources of information the reader would need to answer them. This framework was the basis of Raphael's original series of research studies. Raphael eventually renamed the categories Pearson and Johnson had used in their taxonomy to be more student-friendly. She renamed Text Explicit to become Right There, Text Implicit to become Think and Search, and Script Implicit to become

On My Own (Raphael, Highfield, & Au, 2006).

### *Positive Features of QAR*

QAR instruction amplifies students' awareness of the necessity of considering both text based and reader based information when answering different types of questions (Helfeldt & Henk, 1990). It provides a common language in the classroom which promotes the ability to have discussions and make visible the largely invisible process of comprehension and answering questions. QAR organizes questioning in a way which can be used within and across grade levels and school subjects. It enables students to be actively involved in the reading process. This process supports school-wide reform for literacy instruction oriented toward higher level thinking. QAR also prepares students for high stakes testing without undermining higher level thinking with text (Raphael & Au, 2005).

### *Effectiveness of QAR to increase achievement in comprehension*

Studies such as those reported by Raphael and Pearson (1985) indicate that students' ability to apply information both from their own knowledge and from texts when answering comprehension questions is of great importance. Students who possess an awareness of the interplay among texts, background knowledge, and types of comprehension questions outperform students who do not. Raphael and Pearson's data reveal that QAR instruction enhances students' awareness of task demand. Ultimately their research showed that sixth grade students who received training in the QAR procedure outperformed those who received no training.

Raphael and McKinney (1983) conducted a study that compared the effects of formal QAR training with a brief orientation and no exposure with fifth and eighth grade students and found that children receiving the training outperformed the control group. The QAR orientation

was found to be more effective with average to low ability students particularly for implicit questions.

Raphael and Wonnacott (1985) found that using the QAR procedure with fourth-grade students improved their ability to answer comprehension questions. The fourth grade students who received QAR training in answering reading comprehension questions outperformed those who did not receive this training. Yet, Raphael and Wonnacott found that the younger students required more training to use the approach effectively.

Ezell and Kohler (1992) examined the effectiveness of the QAR strategy when used with peer-assisted procedures with third graders to improve comprehension. They found that children's performance improved on both answering questions and asking comprehension questions though the use of QAR acquired in a peer-assisted instructional format. Their research found that this strategy is beneficial for low, average, and high achieving students. The intervention improved students' ability to answer comprehension questions as well as generate comprehension questions. Their research demonstrates that QAR may be implemented successfully with students as young as third graders. Some researchers have explored using pictures as part of the QAR strategy. Cortese (2003) suggests that for younger students, using the QAR with pictures is an effective strategy.

#### *Why QAR results in higher comprehension achievement*

Many educators and researchers have observed that students who use QAR implement "lookbacks" more frequently than non QAR users. "Lookbacks" occur when students look back at or review text they have read as a means to help them answer comprehension questions correctly. Raphael and Pearson (1985) found that students of high ability who are successful in answering comprehension questions, use "lookbacks" more effectively than students of lower

ability. Yet, students of average and low ability levels in their study improved in their capability to refer back to the text when taught the QAR procedure. Raphael and Pearson also stated in their research study that QAR enabled students to use their background knowledge effectively to make meaning from the text. The researchers state that QAR changes the way children approach answering questions. For example, the researchers found that QAR helps students answer implicit questions and use of the approach has a greater impact on average and lower ability students than on higher ability students. QAR instruction also enhances students' awareness of task demands. Younger students can benefit from QAR as well, yet require more instruction and training to use the strategy effectively (Raphael & Wonnacott, 1985). The QAR procedure may be used by students to improve the generation of their own comprehension questions. Question generation is an excellent way to provide additional strategies to improve comprehension (Ezell & Kohler, 1992).

In summary, comprehension is a complex process of constructing meaning from the text and can be improved when students are taught strategies to implement which enable them to take an active role while reading. The National Reading Panel (Guthrie, 2003) from 1997 to 2000 reviewed research concerning reading comprehension instruction and found twelve categories of comprehension instruction that help readers construct meaning as they read and as a result improve comprehension. These research-based strategies invigorate both audio and visual perception, activate memory and semantic processing, enhance perception, engage syntactic knowledge and processing, teach narrative structure, and promote reasoning. The twelve categories of instruction include: active listening, comprehension monitoring, prior knowledge, mental imagery, mnemonics, graphic organizers, vocabulary instruction, question answering, question generation, summarization, and multiple-strategy instruction.

Questioning is a beneficial comprehension strategy for readers to employ because it allows readers to interact easily with the text and evaluate and make connections to it. Studies suggest that questioning is most effective when students are actively involved in this process. The Question-Answer-Relationship (QAR) strategy engages students in the questioning process and teaches them that there are different sources to consult to assist them in answering questions.

Many studies have been conducted that support the use of QAR because of its ability to improve comprehension. QAR can improve comprehension and literacy because it provides a common language in classrooms, as well as a framework for organizing questioning activities and comprehension instruction. It also provides high levels of thinking about text and prepares students for high stakes testing. It has been shown to be beneficial for all students, especially those of average to low ability. It also been stated that QAR can be used as a school wide initiative to improve comprehension because of its ability to be used across grade levels and with different types of curriculum and subject areas. Ultimately QAR allows students to be actively involved in reading comprehension.

## **CHAPTER III**

### **METHODS**

The purposes of this study were twofold. First, the study sought to examine the effect of the reading strategy QAR, on the comprehension level of fourth grade students as measured by the Anne Arundel County Public Schools Language Arts Benchmark exam. The second purpose was to examine the effect of the reading strategy QAR by gender, on the comprehension level of fourth grade students as measured by the Anne Arundel County Public Schools Language Arts Benchmark exam

#### **Design**

This study employed a quasi-experimental research design and compared the comprehension scores of two groups of students on the Anne Arundel County Public Schools Language Arts Benchmark exam. One group received QAR training and had time to practice the procedure in addition to receiving traditional comprehension instruction. The other group received only traditional comprehension instruction. The traditional comprehension instruction included the use of the Open Court Reading (Adams, 2002) series as well as explicit lessons created by Anne Arundel County Public Schools resource staff to supplement the curriculum in order to meet standards within the Maryland Voluntary State Curriculum.

#### **Subjects**

The subjects in the first group who received both QAR instruction and traditional instruction resided in Shady Side, Maryland which is a more rural area than many communities within Anne Arundel County. There is low student mobility in this area. In 2008, there were eight entrants and five withdrawals school wide. Shady Side is a somewhat wealthier community than many regions in Maryland. The estimated median household income in 2007 in Shady Side

was \$89,043 while the estimated median household income in Maryland was \$68,080 per year. Major industries in Shady Side include farming, marinas, fishing, home-based businesses, services, construction, and retail.

The subjects from the first group consisted of 13 males and 10 females. Four were special education students. Two of these 4 special education students received some instruction in a self contained classroom with the special educator approximately 45 minutes a day while the other 2 received all of their instruction within the general education classroom setting. Two students received free and reduced meals services. Twenty one of the 23 students were Caucasian. One was African American and 1 was Indian. Five of the 23 students were considered above level students, while 11 students were considered on grade level and 7 were considered below grade level.

The group of students who did not receive the QAR training also attended Anne Arundel County Public Schools. However, these students reside in Arnold, Maryland. Arnold is a wealthier part of Anne Arundel County with the estimated median household income being \$96,327 in 2007. There were 26 students in this class, 15 male and 11 female. Of the 26 students 21 were Caucasian, 3 were African American, 1 was bi-racial (i.e. Caucasian and African American), and 1 was Asian, Hispanic and Caucasian. Four of the students were special education students. This classroom contained 4 students identified as focus group students. Focus group students are low achieving students who did not qualify for special education placement. The rest of the students were considered on or above grade level.

### **Instrumentation**

The Anne Arundel County Public Schools Benchmark exams contained three different sections. Section one contained vocabulary exercises. Section two consisted of multiple meaning

word questions while section three posed comprehension questions. Each school system benchmark contained 14 selected response and comprehension questions. The assessments contained brief constructed responses as well. These are short answer or essay questions which also check students' comprehension of texts read within the test. These test questions were purchased from an item bank produced by the McGraw Hill Publishing Company (2002). While there is no research available regarding the reliability and validity of these exams, they do have respectable point biserial ranges, indicating that the items appear to adequately discriminate between different levels of achievement on the test. Research also has been conducted by Anne Arundel County Public Schools staff to examine the test's predictability of student performance on Maryland State Assessment (2002). The benchmarks have an 89.6% accuracy rate in predicting the pass/fail rate of students for the selected response questions.

### **Procedure**

Initially, the first language arts benchmark was given to both groups in the fall of 2008. The second language arts benchmarks were administered in the winter. A "difference score" which was the difference between each student's fall and winter benchmark score, was calculated. An "average difference score" was then calculated for the experimental (i.e. QAR group) and the control (i.e. non-QAR group). This score was used as the pretest achievement level for this study. Following the pretest, students in the QAR group received training in QAR in addition to regular reading comprehension instruction. The second group received only regular comprehension instruction and no additional training.

For students in the QAR group, the teacher introduced the QAR strategy and explained that there are different sources students could use to assist them in answering comprehension questions. She began by introducing the students to the two major categories of QAR which

include “in the book” questions and “in my head” questions. Students had an opportunity to practice distinguishing between the two categories. The students used pinch cards and incorporated these into classroom discussions. The teacher first modeled how to use these cards and then allowed students to discuss with a partner their QAR category before classifying a question and showing this response with a pinch card. This activity was done in class for approximately 2 weeks. In the second week, students worked independently to identify the two question categories. The students also were given comprehension questions as part of the Open Court curriculum each week, but were asked to identify the question categories. The children also had an opportunity to do this in a small group setting with leveled texts.

Once the students mastered the two basic categories of QAR, the teacher introduced the students to the remaining categories, but then focused instruction on “right there” and “think and search” questions. The teacher instructed the students on these categories next because she felt they were more concrete than the other categories and would be easier for the students to master.

After students became proficient in identifying these two categories of questions, the teacher introduced subcategories of questioning types within the two existing major categories of “in the book” and “in my head” questions. Under the category of “in the book” the teacher then introduced the category “right there” followed by “think and search” questions. Once again, students received modeling as well as guided and independent practice in identifying question types. The students again were given pinch cards to use during classroom discussions. These cards also were used during small group discussions. Again, students identified the question categories for their Open Court comprehension questions. Students also had the opportunity to identify question categories for comprehension questions for the students’ leveled texts which were used during small group instruction.

The teacher then introduced under the category of “in my head,” questions those that were “author and me” questions as well as those that were “on my own” questions. Again, students received modeling, guided, and independent practice in identifying question types. Students first applied the QAR strategy to their language arts texts which included fiction as well as expository text. This was done in the same manner as stated above. Once students were able to use QAR in language arts instruction, the students next applied the QAR strategy to other content areas such as science and social studies. The teacher also began having the students create their own questions for various texts and allowing students to classify the questions they had written.

Students in both groups then were given the third Anne Arundel County Public Schools Language Arts Benchmark exam which was the post-test for this study. As was the case with the fall, 2008 versus winter, 2009 benchmark results, “an average difference score” was calculated for both the experimental (i.e. QAR group) and the control (i.e. non- QAR group). An analysis was done which compared the “average difference scores” of students in each group on the pretest and with their “average difference scores” on the post-test. The results of analysis are discussed in Chapter Four of this study.

**CHAPTER IV**  
**RESULTS**

The primary purpose of this study was to determine whether there was a statistically significant improvement in reading comprehension among a group of fourth grade students using the QAR reading strategy in addition to receiving regular reading instruction using the Open Court reading program (i.e. the experimental group) compared to fourth graders who received instruction using only the Open Court program (i.e. the control group). Reading comprehension was assessed using the locally-developed Anne Arundel County (AACPS) Reading/Language Arts assessments.

Table I below contains the average reading comprehension scores on the fall, 2008, winter, 2009 and spring, 2009 AACPS reading/language arts benchmarks for both the experimental and the control group. It is important to note the “difference” scores that are reported which are based upon the average differences in student performance on the fall, 2008 versus winter, 2009 benchmarks. Similarly, differences in student performance also are reported between the winter, 2009 and spring, 2009 administrations of the AACPS Reading/Language Arts benchmarks.

Table I

**A Comparison of Student performance on the Fall, 2008 versus Winter, 2009 Reading/Language Arts Benchmarks and the Winter, 2009 versus Spring, 2009 Benchmarks**

|                      | Fall, '08 |       | Winter, '09 |       | Difference. | Winter, '09 |       | Spring, ;09 |       | Difference |
|----------------------|-----------|-------|-------------|-------|-------------|-------------|-------|-------------|-------|------------|
|                      | Mean      | S.D.  | Mean        | S.D.  |             | Mean        | S.D.  | Mean        | S.D.  |            |
| <b>QAR Group</b>     | 69.57%    | 0.13% | 69.57%      | 0.01% | 0.00%       | 69.57%      | 0.01% | 74.03%      | 0.13% | 4.45%      |
| <b>Control Group</b> | 70.69%    | 19.2% | 70.66%      | 0.19% | -0.19%      | 70.66%      | 0.19% | 79.82%      | 0.16% | 8.30%      |

The results reported in Table I indicate that there was very little *difference* in the

reading comprehension performance of students in the experimental (i.e. QAR )group (0.00%) compared to the control group (0.19%) between the fall, 2008 and winter, 2009 administrations of the AACPS Language Arts benchmarks. However, in comparing differences in the Winter, 2009 versus Spring, 2009 AACPS Language Arts benchmark performance of the experimental group with the performance of the control group during this same performance, there was an average 4.45% difference in performance of students in the QAR group compared with an average 8.30% difference in performance among students in the control group.

In order to determine whether the differences reported above between students receiving QAR instruction and students in the control group, a t test for independent groups procedure was used. These results ( $t(46) = 0.634, p > .05$ ) suggest that there was no statistically significant difference between the reading comprehension performance of students in the experimental group who received both QAR and Open Court reading instruction when compared with the control group who received Open Court reading instruction only.

In order to determine whether QAR instruction had a differential effect upon males versus females, an analysis by gender was conducted. The overall performance of males versus females within both the experimental and the control groups is reported in Table II below. Differences between the two groups are also reported. Mean differences between males versus females for both the experimental and the control group suggest that there was no statistically significant differences in performance by gender on the AACPS Language Arts benchmark assessments.

**Table II**  
**A Comparison of Student performance on the Fall, 2008 versus Winter, 2009**  
**Reading/Language Arts Benchmarks and the Winter,2009 versus Spring, 2009**  
**Benchmarks**

|               | Males |      |        |      |        |       |      | Females |      |        |      |        |      |      |
|---------------|-------|------|--------|------|--------|-------|------|---------|------|--------|------|--------|------|------|
|               | Fall  |      | Winter |      | Spring |       | Diff | Fall    |      | Winter |      | Spring |      | Diff |
|               | Mean  | S.D. | Mean   | S.D. | Mean   | S.D.  |      | Mean    | S.D. | Mean   | S.D. | Mean   | S.D. |      |
| QAR Group     | 69.23 | 14.3 | 69.78  | 12.8 | 71.05  | 13.7  | 1.27 | 70.0    | 13.1 | 69.3   | 10.7 | 77.9   | 10.8 | 8.6  |
| Control Group | 70.0  | 18.5 | 68.4   | 19.3 | 77.1   | 15.09 | 5.6  | 71.6    | 20.4 | 73.6   | 17.8 | 83.6   | 14.4 | 11.9 |

In order to determine whether there was a statistically significant difference in the mean differences in performance between the two groups, a t test for independent groups procedure was used to compare the winter, 2009 versus spring, 2009 mean differences in performance between the two groups. The mean difference in performance between males in the QAR group between the winter, 2009 administration of the AACPS benchmark assessments and the spring, 2009 assessments was 1.27%. The mean difference in performance between males in the control group between the winter, 2009 administration of the AACPS benchmark assessments and the spring, 2009 assessments was 5.6%. Informally, these results suggest that the control group performed slightly better than the experimental group between the winter, 2009 and spring, 2009 benchmark assessments.

A t test of independent groups procedure was used to determine whether these differences in performance were statistically significant. The results ( $t(19) = 0.353, p > .05$ ) suggest that there was no statistically significant difference in the performance of males in the experimental versus control group on the AACPS benchmark assessments.

Table II also reports the performance for females. Among females in the QAR experimental group, a mean difference score of 8.6% is reported in Table II. For the control

group, a difference score of 11.9 percent is reported in Table II. In order to determine whether these mean difference scores were significant a t test for independent groups was conducted. The results ( $t(13) = 0.566, p > .05$ ) suggest that there was no statistically significant difference in the winter, 2009 versus spring, 2009 performance of males versus females in the experimental versus control groups in this study. Some suggested problems of internal validity that may have had an impact on the results of this study, along with suggested solutions are discussed by the researcher in Chapter V.

## **CHAPTER V**

### **DISCUSSION**

The purpose of this study was to determine whether the use of the QAR reading strategy in addition to Open Court reading instruction would result in a statistically significant improvement in the reading comprehension performance of a group of fourth graders, as measured by the Anne Arundel County Language Arts/Reading benchmark assessments. The null hypothesis of this study was that there would be no difference in the performance of fourth grade students using QAR and the performance of students not using this strategy as determined by results from student performance on the Anne Arundel County Language Arts Benchmark exam.

The results that are reported indicate that there was very little difference in the reading comprehension performance of students in the experimental group compared to the control group between the fall and winter administrations of the AACPS Language Arts Benchmark. However, in comparing differences in the winter and spring administrations, the experimental group students who received the QAR instruction had an average difference score of 4.45% compared with an average of 8.30% for the control group students. Additionally, the test of statistical significance that was used (i.e. the t test for independent groups) suggests that there was no statistically significant difference between the reading comprehension performance of students in the experimental group who received both QAR and Open Court reading instruction when compared with the control group who received Open Court reading instruction only.

An analysis also was done to determine whether QAR instruction had a differential effect when student results were disaggregated by gender. The overall performance of males versus females within both the experimental and control groups again indicated that there was no

statistically significant difference in the performance of the two groups.

### **Threats to Validity**

Following are several threats to the internal validity of this study that may provide alternative explanations for the results that have been reported. For example, differential selection of participants may have played a factor in affecting the results of this research study. The population of special education students from the two groups may have varied in their learning disabilities with the disabilities of some students being much more severe than those of others. A possible solution to this problem would be to analyze the IEPs of students involved within the study in an effort to identify student participants with similar disabilities and levels of reading performance.

Another factor affecting the outcome of this study may be student growth and maturation. The selection maturation interaction could have varied between the two groups of students, meaning that the students matured at different rates. If some students naturally matured in their abilities more rapidly than others, it becomes more difficult to determine the effectiveness of the treatment, in this case QAR strategies. Other intervening factors may be linked to instrumentation. For example, there could have been instability in scores or chance fluctuation within the test. The Anne Arundel County Benchmark exams were not identical through the testing process. The assessments used in this study consisted of three different tests that probably differed in their level of difficulty. Because the difficulty of the pretests and posttest were not identical, variation in test difficulty also may have been a significant threat to the internal validity of this study. A possible solution to this problem simply may have been to administer the first Anne Arundel County Benchmark exam as the pretest as well as the posttest, separated by a six month administration interval, instead of using what psychometrically may have been three different

tests.

In addition to considering possible threats to the internal validity of this study, there also are issues of external validity relating to the generalizability of the results to other larger populations. One such threat to the external validity of this study involves selection treatment interaction. The students were not selected at random to participate within this study but rather were chosen because of their placement within a particular classroom. Because the participants were not selected at random, the groups did not contain much diversity. Both groups included very few minority group students. This very limited diversity among the study participants makes it difficult to apply the research findings of this study to a classroom with a different student composition. A solution to this problem would be to repeat the study but select participants at random, making sure that minority groups were represented within the study. As is frequently the case with educational research, there also was no random assignment of students to the experimental group or the control group.

### **Comparison with Similar Studies**

Many other studies have been conducted which analyze the effect of the QAR reading strategy with students of different grade and ability levels. Raphael and McKinney (1983) conducted a study that compared the effects of formal QAR training with a brief orientation and no exposure with fifth and eighth grade students and found that children receiving the training outperformed the control group. The QAR orientation was found to be more effective with average to low ability students, particularly for implicit questions.

Raphael and Wonnacott (1985) found that using the QAR procedure with fourth grade students improved their ability to answer comprehension questions. The fourth grade students who received QAR training in answering reading comprehension questions outperformed those

who did not receive this training. Yet, Raphael and Wonnacott found that the younger students required more training to use the approach effectively.

Ezell and Kohler (1992) examined the effectiveness of the QAR strategy when used with peer-assisted procedures with third graders to improve comprehension. They found that children's performance improved on both answering questions and asking comprehension questions though the use of QAR acquired in a peer-assisted instructional format. Their research found that this strategy is beneficial for low, average, and high achieving students. The intervention improved students' ability to answer comprehension questions as well as generate comprehension questions. Their research demonstrates that QAR may be implemented successfully with students as young as third graders. Some researchers have explored using pictures as part of the QAR strategy. Cortese (2003) suggests that for younger students, using the QAR with pictures is an effective strategy.

### **Suggestions for Further Study**

One suggestion for further research as an outgrowth of this study might be the replicating this study after correcting the various threats to internal and external validity as stated above. In replicating the study, it also could be expanded to include more intensive instruction involving the QAR strategy. The teacher would be able to spend more time instructing the students as to how to use the strategy as well as understanding its importance and how the strategy can help the students be more successful readers.

Researchers also may be interested in how this strategy affects students of various ability levels. Perhaps this strategy is best suited for students whose needs differ from those involved in this study. Another suggestion might be to replicate this study with older students in lower grades, or with students in lower grades, to determine whether this strategy has greater benefit

for older or younger students than for intermediate elementary students such as those in this study.

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