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FROM FOURTH GRADE SLUMP TO FOURTH GRADE TRIUMPH

by

Maria Delsing

Dissertation

Submitted to the Faculty of

Olivet Nazarene University

School of Graduate and Continuing Studies

in Partial Fulfillment of the Requirements for

the Degree of

Doctor of Education

in

Ethical Leadership

May 6, 2010

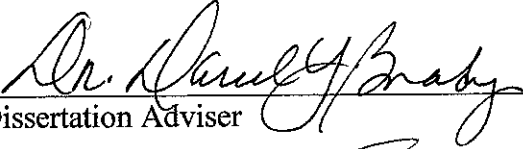
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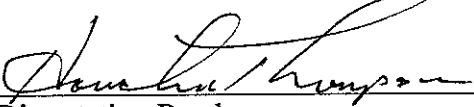
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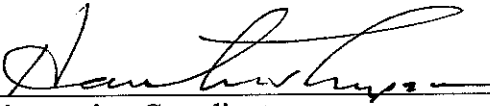
Dissertation


Dissertation Adviser


4/22/2010
Date


Dissertation Reader

4/22/10
Date


Dissertation Coordinator

4/22/10
Date


Program Director

5/1/10
Date


Vice-President for Academic Affairs

5-5-2010
Date


Dean of the School of Graduate and Continuing Studies

5-5-10
Date

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ACKNOWLEDGEMENTS

I would like to thank my chairperson of my dissertation committee, Dr. Darcel Brady, for her valuable feedback, guidance, and encouragement during the development of this dissertation. I would like to thank Dr. Houston Thompson as part of my dissertation team and his valuable input towards the completion of this paper. I would also like to thank Dr. Melvin Welch for his continual support and dedication to our class that made it possible to graduate on time.

This dissertation is the result of the actions of a number of individuals among the faculty; particularly Mr. Allen Mosley, principal of Arna W. Bontemps School; literacy coach, Jennifer LePretre; the two fourth grade teachers, Ms. Lisa BoNey, and Ms. Deborah Heags as well as all the fourth grade students. Without their support and implementation of this project it would not have been possible to make it a reality. Lee Fahrner's reviewing and offering suggestions during the writing process was invaluable.

DEDICATION

I would like to dedicate this project to my husband, Richard, for his continual support and help. Without him by my side I could not have succeeded. To my mother, Marcella Miller, it was her continual encouragement, understanding and especially her inspiration that gave me the courage to pursue this degree. To my daughter, Mary Ellen Dalhouse, for her continued support, insight, encouragement and help during this process and to my son, Frank Delsing, for providing ideas on what direction would be most beneficial for the interventions that would help the students.

ABSTRACT

by

Maria Delsing, Ed.D.
Olivet Nazarene University
May 2010

Major Area: Ethical Leadership

Number of Words: 120

The Fourth Grade slump has been a phenomenon that was identified over 50 years ago and is most prevalent among students from low achieving schools. This applied research project focused on students using material that was readily available and was free or low cost to help prevent the slump. Students created inference questions, as well as other critical thinking questions, as they read the material. They also played the Set Game daily. Students in this school had historically experienced the fourth grade slump as demonstrated on the standardized tests for the last four years. The study was implemented for one semester and for the first time in five years the fourth grade students did not experience the fourth grade slump.

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CHAPTER I

INTRODUCTION

I was gazing through a window looking at the fourth grade students as their eyes shone with excitement; they were anxiously, excitedly waiting for their end of the year test scores. Most of the students did very well in third grade and were anticipating the same results in fourth grade. Then they received their test scores and more than half of these excited faces changed from smiles to sadness. A few started to cry; some just put their heads down on their desks. What just happened to these bright-eyed, excited students? They had just received their test scores and found out that they were going to have to go to summer school or repeat the fourth grade. How did this happen? Are schools spending too much time on test taking and forgetting to teach our children how to think? Has the very important law No Child Left Behind actually left more children behind because of the emphasis on passing tests instead of developing critical thinking skills?

Many third grade students in inner-city Chicago Public Schools perform at grade level. Yet when these same children are fourth grade students, they perform below grade level on the standardized test. Chall (1986) has determined this phenomenon is prevalent among low achieving schools. Often times these students never recover and are not able to achieve on grade level. Catts, Hogan and Fey (2003) feel that the drop in reading scores in fourth grade is due to the demands of the type of reading required. In early years, accurately recognizing words is the emphasis, while in fourth grade comprehension is the main focus. Along with being able to understand

what they read, students must be able to read words quickly. This may be one reason why students lack the ability to do well on standardized reading tests. Researchers have studied the problem and some think it is due to lack of vocabulary (Marzano, 2004). Others have cited lack of fluency skills and poor comprehension skills (Highfield, Au, & Raphael, 2006; Rasinski, 2003) .

Pogrow (1988) initially conducted a study focusing on higher-order thinking skills (HOTS) to investigate the use of critical thinking activities and their effect on grade level success. His study with students who had Individual Educational Plans (IEPs) found that when the focus was on critical thinking skills, most students were able to perform on grade level, but some of the students scored above grade level. This study is explained on Pogrow's web site (Pogrow, 2005), "HOTS is a complete general thinking skills program for Title I and LD students in grades 4-8 that dramatically accelerates learning, test scores and social confidence." The problem with the HOTS program has to do with training the teachers, not the success the program has experienced. The cost per teacher is over \$6700 according to Pogrow's website. Most school districts do not have that amount of money for one teacher, let alone for the whole staff for professional development. The question becomes could these results be achieved using free or low cost activities to help students develop critical thinking skills?

According to Ivy and Fisher (2006) there is a schism between teaching slow readers the basics and having students read critically. If we do not or are not taught to think about what we read then reading will never have any meaning. Walmsley (2006) suggests that many students have well-developed basic literacy skills but falter when it comes to critical thinking. This problem has become more apparent since the No Child Left Behind Act (2002) was enacted and may explain why reading scores drop

in fourth grade. A greater emphasis is placed on inferences and drawing conclusions on the fourth grade Illinois State Achievement Test and these skills require critical thinking skills.

Statement of the Problem

The purpose of this study was to determine the effectiveness, extent, and predictive value of selected critical thinking activities. Chall (1986), who coined the phrase “Fourth Grade Slump”, noted that some fourth grade students’ reading scores dropped and others showed little or no improvement. These same students were at grade level in third grade. This phenomenon was most prevalent for students who came from low achieving schools. These same students had the opportunity to participate in before school, after school, and Saturday classes. Would a different approach to helping students achieve success make a difference? Could using low cost or free materials on a daily basis help students improve their critical thinking skills and in turn help students become successful learners?

Background

The No Child Left Behind Act (2002), was implemented to help ensure that all students have an opportunity to learn and achieve their goals in life. Part of the No Child Left Behind Act requires all schools to do some type of assessment of their choosing. The State of Illinois uses its own state test: The Illinois Standard Achievement Tests (ISAT). Schools that need help are given additional financial support to bring in programs to help bolster the learning process for all children. The ISAT is now being used as the benchmark to determine whether or not children and schools are meeting yearly minimum requirements. Greater emphasis on tests has caused many schools to change their methods of teaching, placing greater emphasis on test-taking skills. In the process of teaching children to pass tests, has the teaching

of children how to think been abandoned? Schrerer (2008) acknowledged that with the pressure on students passing tests teachers have less time to add a course called *Thinking Skills* to the curriculum.

Fourth grade students in a Midwest inner-city school were not making sufficient academic progress. In 2005, 44% of third grade students were classified on grade level in reading. In 2006 when these same students were in fourth grade, only 37% were on grade level and in 2007 as fifth graders only 24% of the students were considered to be on grade level in reading, as recorded on the ISAT according to the Illinois State Board of Education (2006). All students were given the opportunity to participate in morning school, after school and Saturday classes to help supplement reading and math skills. Still these children were falling further behind. To keep students from falling behind, Darmer (1995) implemented a program with low achieving students that focused on HOTS. By the end of that program, all students showed improvement, and one student had increased his standardized test scores by five years and four months. In that same study, students who were in the control group participated in before and after school programs that focused on reading and math. These students experienced a drop in standardized test scores.

Many studies have been conducted to identify the reason for the “Fourth-Grade Slump” that was identified by Chall (1986) as being most prevalent among students attending low achieving schools. Additional studies done by Chall and Jacobs (2003) showed that the phenomenon was caused by lack of fluency and automaticity in reading. Chall and Jacobs concluded the cause could be explained by a change in reading focus. Through the end of third grade, reading instruction focuses on decoding, but in fourth grade the focus shifts to reading to learn. The explanation was that the language turns from literary to abstract and is more complex than the

everyday oral interaction that students participate in with each other (Chall & Jacobs). Many of the studies that have been done on the fourth-grade slump confirm this problem; however, researchers differ as to the cause. Hirsch (2003) feels the problem is based on vocabulary differences between advantaged and disadvantaged students. He feels the vocabulary required of fourth grade students is more rigorous than the vocabulary students encounter in third grade. DeLeon (2002) feels that comprehension should be the focus so that students learn specific strategies to help understand the more complex text. Another study focused on helping students build their background knowledge so they would become more familiar with the less cohesive material (Pressley, Johnson, Symons, McGoldrick, & Kurita, 1989).

Fink and Samuels (2007) found that the emphasis of learning in third grade is focused on word recognition and decoding while in fourth grade the jump is made to comprehension and fluency. Bloom's Taxonomy would suggest that the skills required for third grade learning are on the first level of thinking, known as knowledge, whereas the skills required for fourth grade move up another level to comprehension and require a greater use of higher-order thinking skills.

Research Questions

This study was driven by the following research questions:

1. What effect does the use of selected critical thinking activities have on the fourth grade slump?
2. What percentage of the activities must students excel in to avoid the fourth grade slump?
3. To what extent can each activity serve as a predictor in avoiding the fourth grade slump?

Description of Terms

IEP. Individual Educational Plan.

Low Achieving School. School where less than fifty percent of the students are on grade level.

Illinois State Achievement Test (ISAT). “The Illinois State Achievement Test”
An instrument that measures individual student achievement relative to the Illinois Learning

Stanford Learning Reading Test. This is a normed test that is given by the Chicago Public School system twice a year to assess student progress in reading. It was published by Harcourt Assessment, Inc..in 2006.

Set Game. Set game was created by the Population Geneticist, Marsha Jean Falco (1991). Set game has a total of 81 cards with all the cards having one of three different colors, symbols, or shading. The object is to find sets of three cards that all match the criteria; they may be all the same color, but different shapes or different shadings or they could be all the same shadings, but different colors, and different shapes. The rule is simple. They must all be the same or they must all be different. In 1991 MENSA named Set Game the “Best New Mind Game based on originality, intellectual challenge, aesthetics, quality, design, and longevity.” (Etra, 1996)

Significance of the Study

This study is important to help fourth grade students maintain academic achievement comparable to previous grade level success. When students fall behind in fourth grade many of them never recover and are at greater risk of dropping out of school. The financial burden placed on schools today makes it a necessity to find ways to help students stay on grade level without having to increase funding. Students who have success in school have a greater chance to realize their dreams and fulfill

their potential. When students have success, they have a better self-image and they are more likely to be engaged in school. The method in which we deliver the information is not as important as encouraging students to think critically. Giving students the skills to think will not only help the students pass the standardized tests, but will give them the opportunity to be in charge of their own learning (Delpit, 2006).

College students who come in with a deficit in mathematics are successful when the focus is on finding a solution using different and varied strategies rather than focusing on operations. For example, when students are required to think critically they will find success, and in turn this will help their self-esteem (Delpit, 1996). If using 20 minutes a day to help develop critical thinking skills will help students become better learners, then they will be given the tools they will need to be lifelong learners. Standardized tests are just one tool to measure student academic growth. If we focus all our teaching and student learning on how to pass a test, instead of teaching children how to think we are shortchanging our children and not giving them the ability to reach their full potential, which is the goal of the No Child Left Behind Act (2002).

Procedure to Accomplish

This study was conducted at an inner-city school located in Chicago, Illinois. Ninety-eight percent of the students receive free or reduced lunch. The school is 99% African American, and the other one percent is Hispanic. The 31 participants are all fourth graders. Four of the students have an IEP, six of the students are repeating fourth-grade, and 21 of the students are considered to be on grade level based on the third grade ISAT test scores but may not be reading on grade level as demonstrated on their third grade ISAT.

Two teachers, one a first year teacher and the other an experienced teacher, implemented the research activities in a low achieving fourth grade elementary school. One teacher had been teaching four years as a fourth grade teacher. The other teacher was a first year teacher who did her student teaching in fourth grade and was a teacher assistant before becoming a certified teacher. Both teachers have their Bachelors Degree and one teacher holds her Masters Degree in Educational Administration. Both teachers have been working with low income students for their entire career.

All fourth grade students from a large metropolitan low achieving school participated in the study, but students who were promoted from third grade level to the fourth grade were the main focus. Students who were promoted to third grade were considered ready for fourth grade according to the standards of the Chicago Public School. Policy stated on their web site (cps.k12.il.us/Promotion.html. retrieved, 2008).

Teachers were trained on the “Set Game” and its usage. “The object of the game is to identify a 'Set' of three cards from 12 cards laid out on the table. Each card has a variation of the following four features:

- (1) Color: Each card is *red*, *green*, or *purple*.
- (2) Symbol: Each card contains *ovals*, *squiggles*, or *diamonds*.
- (3) Number: each card has *one*, *two*, or *three* symbols.
- (4) Shading: Each card is *solid*, *open*, or *striped*.

A 'Set' consists of three cards in which each feature is EITHER the same on each card OR is different on each card. That is to say, any feature in the 'Set' of three cards is either common to all three cards or is different on each card.

Students were introduced to Set Game first and allowed to work on this activity for two weeks. They had a choice of working independently or in small groups. Their progress was monitored using a running record showing how many sets they could find in the allotted amount of time and, if they were able to find all six sets, how long it took them to find all the sets. The third week they started their day working independently on Set Game. Students continued to work using this format for the duration of the study and the running record of the Set Game continued.

One week later the students were introduced to nonfiction stories and articles. They learned how to create questions from their reading. They were encouraged to create different types of questions. The teachers and the literacy coach modeled for the students for the first week. The second week students worked in small groups and created questions from their reading. After four weeks the students were then given books or articles to read and create questions on their own. Students recorded their answers on their answer sheets and these were kept in their portfolios along with their Set Game responses. Students continued to work on creating questions from their readings on a daily basis for the duration of the study.

The third activity used was the Sudoku game. This was introduced after the students were comfortable with the Set Game and creating questions from their reading. Sudoku has been found to be a mathematical logistical activity that helps students think logically. The activity was first introduced as a whole group activity, then as a small group activity, and finally when the students felt they understood the concept they worked the puzzle independently. The last activity that was going to be introduced was Sudoku, but due to the lack of time the data from this activity was not used in the data analysis.

ISAT was used to give a historical perspective to the severity of the fourth grade slump over the past four years in the school where the research was conducted as well as to compare it to the results of this year's success. Running records were kept on student success with the various critical thinking activities. Each student had a portfolio which was kept and recorded on a daily basis. When they were working on Set Game, they recorded how many sets were found on a single day. The number of sets that a student was able to assemble in daily practice was averaged over a week and then compared with the success they had on standardized test results. The types of questions were measured according to their classification. A rank of one would be a question in which the answer could easily be found in the reading. A rank of two would be a definition-type question, understanding the meaning of a particular word or group of words. A rank of three would be an inference question, one in which the answer could be figured out from the reading but was not directly stated. A rank of four would be a type of question in which further research or reading would need to be done to find the answer. Sudoku was ranked according to the amount of success with each puzzle and the results were kept in their portfolio. These records were used to help determine what level of success a student must achieve in order to be successful on standardized tests. These records were also used to determine which activities students needed to focus on to help predict student success. Were students successful if they were able to master two or three of the activities, or must they be successful in all four activities to be successful? Is there any one activity that all successful students mastered? Regression analysis was used to help answer these questions. To answer question three, the student success was recorded and charted for each activity, then the activities were compared among the successful students. The goal was to see if any one activity could be used to identify as a predictor for success.

Fourth grade is a pivotal grade for preventing students from falling behind in their academic achievement. If using a few minutes each day to focus on critical thinking activities helps avoid the downward spiral for some students, then the time is well spent. Researchers have studied the importance of staying on track in learning. However many researchers have different ideas on how to help students and this will be discussed in the next chapter.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The hypothesis of this study is as follows: Fourth-grade students, who performed at grade level in third grade in reading on the Illinois State Achievement Test (ISAT), when exposed to critical thinking activities, will maintain success in reading as measured by standardized tests. Many administrators, teachers, and parents are quick to blame the No Child Left Behind Act (NCLB) as a source for the failure of our students because of the types of tests used to monitor student progress in the majority of schools. If this is true, why was “the fourth-grade slump” identified as a concern for many educators in the 1950s, prior to NCLB? The phenomenon of understanding the meaning of the fourth-grade slump, and why it occurs, needs further investigation. Fourth-grade slump was identified in the 1950s and 1960s by Walter Loban (1976). Loban conducted a 12-year longitudinal study of students from 1st through 12th grades. He noted a drop in reading performance, becoming more pronounced starting in the fourth grade and continuing throughout the student’s academic life. Loban used the analogy of a funnel on its side. During the first three years of school, there were small differences between the successful student and the struggling student. Then, in the fourth grade, the ability gap increased sharply. As the students continued throughout their education, the gap between the successful students and the struggling students continued to widen.

Many researchers have scrutinized NCLB. Guisbond and Neill (2004) suggested that NCLB has two major flaws. The first flaw is that NCLB mandates that raising standardized test scores should be the primary focus of schools. However, a study conducted by Rose and Gallup (2000) suggests that the most important role of the school should be to prepare students to become responsible students.

No Child Left Behind Act - Impact on Student Achievement

The gap between low-achieving students and high-achieving students seems to be growing wider since the No Child Left Behind Act was implemented. This gap can be demonstrated by one low-performing, inner-city school located in Chicago. The Illinois State Achievement Test was given annually to all students beginning with the 2006–2007 school year. Prior to that time, the ISAT was given to students only in grades three, six, and eight. The following statistics reveal this gap in reading achievement: In 2005, 44% of third graders at the above-mentioned school met or exceeded grade level in reading. In 2006, only 37% of fourth graders attained grade level or above, a 7% drop. Moreover, sixth-grade test results in 2007 showed that 37% of the students reached grade level or above in reading. Similarly, a review of the 2006 test results of third graders indicated that 59% scored at grade level or above in reading. One year later, the fourth-grade scores showed that 41% attained grade level or above in reading, an 18% decline (Illinois State Board of Education, 2007). Many researchers have expressed concern about the rigorous curriculum that is being presented to low-achieving students (Aronson, 2004; Delpit, 1996; Landsman, 2004).

The second major flaw concerns the assumption that poor teachers are the cause of unsatisfactory student performance, and the belief that threats and sanctions against these teachers will improve this deficit. When the bulk of blame is placed on

teachers, leaders ignore the impact of family poverty as well as inadequate school funding on the ability of students to achieve (Guisbond & Neill, 2004).

Houston (2007) stated that many of the problems in education were in the process of being fixed when NCLB was enacted, and that NCLB did not address the real problems. He talked about the seven deadly sins that have been created by NCLB. The first is assuming that schools were broken when, in fact, they were not. He feels that schools have not failed, but the mission of schools has changed since originally established, and testing today does not focus on the skills that should be fostered. These skills include collaboration, ingenuity, problem solving, and many more less-tangible skills. Houston feels that using standardized tests is equivalent to doctors treating head colds the same as lung cancer.

Second, Houston (2007) suggested that educators confuse testing with education. If we place too much emphasis on just one standardized test, then we will sacrifice higher possibilities for our children. We would discuss student achievement as it relates to one single test. The tests should be used as a tool to help assess where children are. The tests should be just one of many instruments needed to view the entire academic level of a child.

Third, are we actually hindering children by ignoring the realities of poverty? If students in low-achieving schools are continually drilled in the basic skills, while students in a middle-class structure partake in a richer curriculum, this further widens the achievement gap between poverty-level and middle-class students. Poverty may lead to inadequate parental medical care for infants and toddlers. Preschool children in poverty-stricken areas may suffer from a lack of mental stimulation. These children may come to school less prepared for life experiences as compared with their middle-class counterparts (Houston, 2007).

Fourth, relying on fear and coercion provides negative motivation and, in turn, traumatizes children. More time is spent on learning how to pass a test, and less time is spent on instruction. The greater pressure to pass the test may cause greater anxiety for students when taking the test. Higher anxiety can be a source of poor performance on standardized tests (Houston, 2007).

Fifth, NCLB is not easily understood by parents and communities. Many do not understand why special needs students are held to the same standard as students who do not have special needs. Testing non-English speaking students in English sets them up for failure and does not give a true picture of what knowledge and skills they have acquired or possess (Houston, 2007).

Sixth, teachers and educators have not been part of the process of creating the guidelines, and because of this, they are treated as less than professional. When everyone comes together and creates a standard, we will see improvement on a measurable scale (Houston, 2007).

Finally, Houston (2007) warned that focusing solely on standardized test scores could harm our place in the international economic arena. Winners of international competitions focus on high-level skills as well as ingenuity. Focusing on standardized tests could stifle creative thinking and lower the level of academic achievement. If we wish to sustain our place in the global community, we must raise our educational standards that challenge students to compete in the academic world.

A study done by Haney (2002) found that norm-referenced tests do not necessarily indicate real progress. Haney also feels that many norm-referenced tests are designed to ensure a certain proportion of failures. Normed tests often include design errors as well as scoring errors, which have always been a part of standardized testing (Rhoades & Madaus, 2003).

NCLB requires schools to demonstrate adequate annual yearly progress (AYP). According to Elmore (2003), this has not been grounded in any proven theory for school improvement. Elmore went on to state, “The AYP requirement, a completely arbitrary mathematical function grounded in no defensible knowledge or theory of school improvement, could, and will, result in penalizing and closing schools that are actually experts in school improvement” (p. 6).

The need for accountability is essential, and providing assistance to teachers to help them do a better job is paramount in helping students improve. Accountability and assessment should be a community-wide endeavor that includes parents, community, teachers, and administrators as well as students. There also must be adequate funding available to help schools develop and implement strategies to raise student achievement (Guisbond & Neill, 2004).

NCLB does allow the states the freedom to choose how they will assess the progress of students. The majority of states have chosen some form of standardized test, but one state has taken a different strategy. Nebraska has implemented a form of assessment called the School-based, Teacher-lead Assessment and Reporting System (STARS). which began in 1999, before NCLB was signed, and it was found to be a more accurate form of assessment. When NCLB was enacted, Nebraska decided to continue using STARS instead of adopting a standardized paper-and-pencil test, because state educators felt that change comes from within the school. Teachers, along with students, developed and implemented a visual rubric assessment. Five basic guidelines must be followed: alignment to state goals, student exposure to content that is free of bias and not offensive, local development appropriate for students, consistent scoring, and mastery levels appropriate for grade level and subject (Gallagher & Ratzlaff, 2008).

As stated, the rubric assessments were developed by the teachers and students. Nebraska's educators found that this practice not only increased reading ability but also had additional side benefits. When students helped create assessments, there was increased student motivation. Students also came up with an additional notation entitled Above and Beyond Rubric Expectations. The students wanted to give credit to those students who did not limit themselves to just what was required (Gallagher & Ratzlaff, 2008).

With the new system came challenges, such as: teachers complaining about insufficient time and some schools struggling with different forms of assessment. More funds were required to develop and implement the new assessment framework as well as for additional staff development. Nebraska's educators and administrators felt that this method was a better alternative to standardized testing, and they plan to continue to develop, train, and implement STARS (Gallagher & Ratzlaff, 2008). If adequate training and funding were available, would other states or school districts look more closely at alternative assessments to measure AYP?

Fourth Grade Slump and Its Possible Causes

During the 1970s and 1980s, Jeanne Chall (1986) studied a phenomenon that she labeled "the fourth-grade slump." Chall and her fellow researchers noted that a gap in reading achievement was more prevalent among poor children. Catts, Hogan, and Fey (2003) identified as many as 19.5% of poor students who could be classified as successful in third grade, but later experienced an academic drop in fourth grade. These same students often could identify words and read fluently, but they showed a mild deficit in language, especially in reading comprehension, vocabulary, and grammar. Hirsch (2001) expressed his opinion that the fourth-grade slump is one of

the greatest failures in American public schools. Since that time, many studies have been conducted to investigate the cause of the slump as well as solutions.

Many researchers have felt that the problem may be due to a shift in instruction from basic decoding and word recognition to developing comprehension and fluency (Fink & Samuels 2008). The problem was so prevalent that, in 2007, the National Institutes of Health awarded a five-year grant to study it. The focus of the various studies may be different, but all have the common goal of finding interventions that can be used in the classroom to help students avoid the slump. Chall (1986) and Stanvick (1986) suggested that the complexity of reading and oral interaction may be the cause of the widening gap. More recent studies continue to confirm the problem and are a source of research. Chall and Jacobs (2003) felt that the phenomenon is caused by a lack of fluency and automaticity in reading. As difficulty in reading increases, student fluency and automaticity decrease, and students avoid reading more difficult materials. Hirsh (2003) felt that the cause may be due to the types of tests given in the earlier grades. In fourth grade, more emphasis is placed on vocabulary, which may account for the drop. Therefore, Hirsh contended that the lack of rich vocabulary accounts for the difference between advantaged and disadvantaged students. Another explanation for the fourth-grade slump is a lack of background knowledge. A study done by Pressely, et al (1989) focused on helping students build their background knowledge so they would become more familiar with the less-cohesive material. A greater focus on comprehension instruction should help students better understand the complex text (De Leon, 2002).

Critical Thinking Activities and Their Impact on Learning

Another theory proposed is a lack of focus on high-level critical thinking activities that help develop cognitive skills and strategies (Halpern, 1995). A central

component of classroom instruction should include high-level critical thinking; when these activities are missing, they could contribute to the fourth-grade slump (Brown, Campione, Ferrara, Reeve, & Palincsar, 1991). Pogrow (2005) asserted that teachers of advantaged students are more likely to gear their instruction to include higher levels of critical thinking, whereas teachers of low-level learners tend to focus on levels of critical thinking such as lecture, drill, and practice activities.

Teachers' attitudes toward using high- or low-level critical thinking activities are generally based on their classroom experiences. Torff and Sessions (2006) suggested that teachers who trained in higher-level critical activities will more likely implement them in their classrooms than those who did not train in higher-level critical thinking (Torff & Sessions).

Torff and Sessions (2006) interviewed 20 social studies teachers from 20 different schools and found 10 different explanations for not using high-level critical thinking activities with low-achieving students:

1. Classroom management problems develop when using high-level critical thinking skills with low-advantaged learners.
2. High-level critical thinking activities are too hard to grade.
3. With today's high-stakes testing, there is not enough time to do these types of activities.
4. My principal does not want me doing these types of activities.
5. Often times what the teachers are doing around me are the same types of activities that I am doing.
6. This is how the parents want teachers to teach their children.
7. Low-level students just do not have the ability to do high-level critical thinking activities.

8. Lack of prior knowledge makes it difficult for low-achieving students to succeed at high-level critical activities.
9. Low-level learners do not have any desire to participate in high-level critical thinking skills.
10. The course content has so many dates and names that it would not help the students to participate in high-level critical thinking activities. (p. 80)

The goal of the study conducted by Torff and Sessions (2006) was to find common ground as to why teachers do not use higher-level critical thinking activities with lower-advantaged learners. The study did find answers, as described above, and it also discovered that these same teachers use higher-level critical thinking activities when working with average or above-average students. There did seem to be one glimmer of hope when teachers started discussing the changes being made to the high-stakes tests: Students are no longer required to answer open-ended questions with written responses (Torff & Sessions).

To help students achieve a higher level of success and reach their greatest potential, “effective teachers intuitively know that student attitudes and academic achievement are improved when learning experiences revolve around the interest, talent and needs of the students” (Texas Metronet, 2001, para. 1). To understand how students learn as learning becomes more complex, it becomes increasingly imperative to use a guide for challenging students. Bloom’s Taxonomy is such an instrument; it helps students improve their thinking (Crawford & Brown, 2002).

Paul and Elder (2007) suggested that thinking is driven by questions. Any and all disciplines are driven not by answers, but by the questions asked, which give others the impetus to think and find answers. Questions help define the issues and generate other questions. That is why when students ask questions, they are thinking

and learning. Feeding students facts does not foster learning; it is when students discover information that they are learning and growing.

Different types of questions help us deal with the many complexities of life. When we question information, we are looking to the sources as well as the quality of that information. Purpose questions force students to define their task. Relevant questions help students discern what bearing the information may or may not have on the question. Paul and Elder (2007) feel that many of the questions being asked in the classroom do not foster students' critical thinking. They are questions that would be categorized as concrete thinking, which is on the lower level of Bloom's Taxonomy.

Paul and Elder (2007) found that the pursuit of Socratic questions helps students explore complex ideas, discuss issues and problems, and discover assumptions. It is important for students to learn from what is not known and to follow the logical implications. The key to Socratic questioning is systematic; it is disciplined and focuses on principles, issues of problems, and foundational concepts. The main purpose of using Socratic questions is to help students question their learning.

Both critical thinking and Socratic questions help to provide conceptual tools for understanding the mind functions. The goal of critical thinking is to establish an additional level of thinking—a powerful inner voice of reason. Socratic questioning helps frame questions that are needed to pursue meaning and truth. Socratic discussion helps cultivate the inner voice through an explicit focus on self-directed, disciplined questioning (Paul & Elder, 2007).

Using Bloom's Taxonomy to focus on higher-order thinking skills (HOTS), as described by Thomas, Thorne, and Small (2001), helps clarify the importance of continually challenging students to use a

higher level of thinking. “HOT . . . takes thinking to higher levels than just restating the facts. HOT requires that we do something with the facts. We must understand them, connect them to each other, categorize them, manipulate them, put them together in new or novel ways, and apply them as we seek new solutions to new problems (para. 7).

Crawford and Brown (2002) described higher-order thinking skills as a composite of three different elements: (a) content thinking, the ability to accept knowledge; (b) critical thinking, the ability to recognize knowledge; and (c) creative knowledge, the ability to generate new knowledge. The highest level of HOTS is related to the highest level of Bloom’s Taxonomy: synthesis and evaluation.

The HOTS program was introduced by Pogrow (1988) to help Chapter One students achieve success in school. The impetus for the HOTS program came from Pogrow’s experience of teaching mathematics in Harlem during the 1960s, as well as his experience and research developed during this time on thinking skills and learning environments (Trotter, 1994). Pogrow continued to search for material that could help middle-grade students. Despite 35 years of reform rhetoric, he found, in his estimation, little in the way of exemplary curriculum (Pogrow, 1995). Pogrow and Buchanan (1985) saw a need to help students who had become classified as having special academic needs. Equity concerns suggested to Pogrow (1995) that these were highly educationally capable students, but because of lack of success, they were not given the opportunity to advance their knowledge. Pogrow (1995) felt that if these students were presented with higher-order thinking skill activities as soon as they were developmentally ready, and taught these skills in such a way that they would enhance the students’ basic skills, these students could experience success in school.

Pogrow (1995) felt that two main ingredients were needed to develop better pedagogical techniques: (a) Teaching practices must be clear and well defined, and (b) Teachers must be trained in state-of-the-art techniques. The program developed by Pogrow and Buchanan (1985) was based on the assumption that students, when given the opportunity, could take control of their learning. Teaching techniques were modified to include departures from traditional teaching. The first change came from understanding that experienced, good teachers often gave students more information than was needed. The teachers were thus trained to give little or no response and let the students figure out the problem on their own. When students responded by sulking, they were ignored. Eventually they would go about the task of finding the answers on their own. It did help if these students saw other students, who were given the same task, try to work through the problems instead of being provided with the information.

The second major change had to do with teacher responses to student conclusions. Teachers were trained to affirm correct responses and negate incorrect responses. Teachers were now challenging students to explain how they came to the conclusions they did. When students came to an incorrect conclusion, they were asked questions, but never directly told they were wrong. Students were allowed the opportunity to recognize their flawed conclusions and then try to find the correct solution (Pogrow 1995).

Pogrow and Buchanan's (1985) teaching design is based on four key general thinking techniques. The first deals with metacognition and understanding how one thinks. The second requires students to figure out unknown information from the surrounding information (i.e., inference from context). The third encourages students to generalize ideas from one context to another context. The fourth technique helps

students combine information from a variety of sources and then identify which pieces of information are needed to solve the problem (i.e., synthesizing information), (Pogrow, 1990b).

The results from the HOTS program, as reported by Pogrow and Buchanan (1985), indicated that standardized test scores improved in five out of six grade levels. Pogrow and Buchanan noted that when students first entered the program, they were impulsive and lacked discipline in their answers. They responded with the first thought that came into their minds. After one year in the program, they were able to vocalize answers with supporting information, and they took their time in answering the questions. They were not as frustrated when they did not know the answers immediately, and they were able to take their time to discover the answers.

There were additional benefits mentioned in this study. The first was the confidence the students now had in their learning ability and with other students who had not been identified as students with special educational needs. Students displayed more self-confidence in their ability to learn (Pogrow & Buchanan, 1985).

The initial study led Pogrow (1990b) to create an innovative curriculum to test the HOTS technique in helping students labeled as educationally challenged achieve success. The new curriculum for students who would normally be in grades four through seven was based on the four key thinking skills and had little direct connection to the classroom curriculum. The setting consisted of ungraded classrooms, and the curriculum objectives were not specifically addressed at the beginning. At the end of two years, the students would be presented with the content that they were to master.

At the conclusion of the study, Pogrow (1990a) noted seven results:

1. Students improved their academic skills as well as, if not better than, a good remedial approach.
2. Students grasped subject matter the first time it was presented when general thinking activities to enhance learning were utilized.
3. At-risk students exhibited high levels of intellectual potential.
4. The relationship between the student and teacher changed; the students were more willing to listen and show respect for their teacher.
5. At-risk students benefitted when the thinking process was modeled for them.
6. Teachers needed to be made aware of the importance of modeling thinking techniques for the students.
7. Teachers needed enough time and resources to implement the program successfully.

Therefore, it was Pogrow's (1990a) assertion that when students are taught how to think and teachers are given the tools and time they need, the at-risk student will have the opportunity to succeed.

Utilization of the HOTS program up to 1994 included 1,700 schools located in 49 different states. The student improvement had been substantial; however, there are critics who feel that Pogrow's research does not measure up to scientifically controlled studies (Trotter, 1994).

Twenty-five years after HOTS was introduced, Pogrow (2005) revisited the program to investigate its effectiveness. Many events had occurred since its inception. Between 1965 and 1988, the achievement gap decreased when specific programs were implemented to help low-achieving students. The gap began to show some signs of narrowing, but it was still too wide. In 1988, Title 1 changed funding to include all

disadvantaged programs that focused on one-size-fits-all students (Pogrow). The results were not encouraging. The gap for fourth-grade students reverted to its 1975 level.

Students who had participated in the HOTS model continued to show growth in their test scores. This was validated not only by Pogrow (2005), but also by Darmer (1995), who observed gains in student academic success as demonstrated on state achievement tests. Darmer noted significant achievement by students in their ability to transfer the learning experience to other disciplines.

Pogrow (2005) asserted that HOTS may be the first program to develop thinking skills that consistently and substantially produce test score gains for at-risk students. HOTS also has the added benefit of transferring to other types of learning. He reported seven reasons why this program works, and others do not work, with disadvantaged students:

1. Most disadvantaged students have the ability to perform at high levels academically and possess normal to high levels of intellectual ability.
2. Learning problems of disadvantaged students in kindergarten through third grade differ from students in fourth through eighth grades, and therefore different approaches are needed.
3. Many disadvantaged students are not able to take advantage of high-quality instruction because they lack a sense of understanding. Extra drill and practice will not correct this problem.
4. Staff development for teachers will have little effect if a sense of student understanding is not developed.

5. This sense of student understanding in disadvantaged students can be developed most effectively in small group settings and worked on for 35 to 40 minutes a day, four days a week.
6. A lack of understanding makes it difficult for disadvantaged students to succeed. However, a sense of understanding does not guarantee academic success later on.
7. The labels “learning disabled” and “Title 1” encompass a variety of different learning needs that need to be addressed with different interventions. Research suggests that most students after grade three receive the wrong intervention.

The HOTS model has been used extensively throughout the country, but it still is not as widespread as Pogrow (1995) would hope, for several reasons. First, the program takes a lot of hard work and luck. Second, the climate for reform is not right. He feels that many of the reforms presented today are based on good intention and idealistic philosophy. Third, the cost may be prohibitive. According to the HOTS website, it costs \$6,800 per teacher for training and materials. Most school districts do not allocate this much money for staff development. Fourth, independent studies do not always support Pogrow’s claims.

The U.S. Department of Education sponsored a study to examine five different programs targeted to help at-risk students: the Accelerated Schools Project, Success for All, the School Development Program, School-based Management, and the Higher-Order Thinking Skills Program (McCollum, 1992). These five were chosen because most at-risk programs incorporate some aspect of each.

Several findings were common to all programs. Context, rather than content, is influenced by the scope of the intervention. The scarcest resource is time, not money.

Recognition of staff development is required for success, and most of the programs lack sufficient professional development. Even when parents are given opportunities and responsibilities in the programs, their involvement is extremely challenging. Teacher leadership and sustained teacher commitment are required, otherwise the programs will be absorbed into the traditional structure and lose their effectiveness. Interesting and challenging instruction geared to higher-order thinking skills is rare. Even the best of programs need connections to social service to make the programs successful (McCollum, 1992).

The government study spanned a period of two years. The first year, McCollum (1992) visited five schools that had implemented one of the five different programs. The HOTS program was used in a medium-sized city in the Southwest. During the study's second year, a medium-sized city in Alaska was the site for evaluation. The findings from the two school districts concluded that teacher training was one of the key components to the program's success. The teachers had to buy into the program, as well as, be willing to implement the program as prescribed. The program was most effective with students who possessed normal intelligence—that is, those students who scored 80 or above, as measured by an IQ test.

Teachers and administrators from both sites were enthusiastic and felt the program was making a difference in student learning and understanding. Small class size, 8 to 15, allowed students to receive more one-on-one attention. Concentration on higher-order thinking activities made HOTS stand out as significantly different from the other models studied. The skills that were taught did not address just one discipline, but were transferred to all disciplines in the curriculum. Students involved in the program had a very positive and enthusiastic response—and, as a side benefit, students expressed more confidence in their learning. The HOTS program fit in with

the Chapter One format, wherein children can be pulled out for 35 to 45 minutes of training daily. Administrators felt that the program had helped to raise student achievement as indicated by test scores on the Iowa Test of Basic Skills (McCollum, 1992).

Along with all the positives, some potential problems should be addressed. McCollum (1992) noted that teachers need more than the HOT'S one week of training in Socratic questioning. The program provides a script for teachers; this is very helpful to teachers, but it could be counterproductive to Socratic philosophy. Integrating the skills being taught in the program to those of other disciplines is one of the keys to the program's success. If teachers in other disciplines are not familiar with or do not understand the program, they may not be willing to implement the skills that the students are using to help them have greater understanding of the material. The importance of not isolating the HOTS teacher from the rest of the curriculum is critical to the students' success. Traditional tests may not be the best means for measuring success, yet this is how the students are assessed.

Researchers noted some of these generic outcomes for all programs. Even though HOTS and Reading Recovery had a greater emphasis on critical thinking skills, if these skills were not embraced by all teachers, the treatments were sometimes ineffective. Most teachers who were exposed to a new program were enthusiastic and tried to implement it into their classes. Many of the strategies introduced were long term and needed to be continually implemented and updated across the grades as well as across the curriculum. The models were not able to effectively involve the parents. The outcomes did not always match the actual learning as demonstrated on standardized tests, and it often took more than one year to see the results needed to validate a program (McCollum, 1992).

Eisenman (1995) conducted an independent study on the effectiveness of the HOTS program. Students from the fourth and fifth grades were the focus, and all received special services, including an individualized educational plan (IEP). The control group was from the same school population and the same grade. The primary focus of the study was self-concept, reading achievement, and higher-order thinking skills. The secondary focus of the study was student gender and the response to HOTS activities.

Eisenman (1995) pre- and posttested the students to assess the effectiveness of the HOTS program. The study incorporated two different levels of exposure to HOTS; this was the first year of implementation for the fourth-grade students and the second year for the fifth-grade students.

One of the greatest challenges the researchers experienced in the Eisenman (1995) study involved the teachers, who had a tendency not to allow students time to respond. When given an incorrect response, teachers wanted to move on to other students who did know the correct answer. The HOTS program required the teacher to give students time to process, and when the response was not what the teacher sought, the teacher needed to ask further probing questions to help the student come up with the correct answer on his/her own. The students found this frustrating, but when they were able to come to the correct conclusion, they showed great enthusiasm for their accomplishment.

Students in the HOTS program measured significantly higher than in self-concept. According to Eisenman (1995), there are two reasons this may have occurred. First, the HOTS activities helped students realize their own ability, which in turn gave the students greater confidence. Second, the students in the control group perceived the students in the experimental group as smarter than they were. This

perception was reinforced by the parents. Students who were not included in the experimental group often had feelings of lack of success, which would be reinforced by other classmates and parents. Students made statements such as “My friends say I go to the dumb class” or “Mom said if I learn to read good, I don’t have to go that [Chapter One] class anymore.” During parent open house, the students in the HOTS program displayed greater confidence in their learning. This attitude transferred to other children who perceived the students in the HOTS program as more academically accomplished. It also influenced the parents and their attitudes toward their children.

Eisenman (1995) found no significant differences in reading achievement between fourth and fifth graders, control group or experimental, males or females. One of the reasons for this lack of difference may be that all teachers need to implement HOTS strategies throughout the curriculum. The researchers felt that if HOTS strategies had been used in the regular classroom, rather than one 45-minute period each day, students would have better facilitated the transfer of skills.

The third area assessed by Eisenman (1995) involved the development of critical thinking skills in the HOTS program. Eisenman found that students in Chapter One programs decreased, rather than increased, their skills in fourth grade, but they rebounded in fifth grade. Educators also debated how to teach critical thinking. Low-achieving students were often comfortable with short answers or with guessing.

Mixed findings by Eisenman (1995) showed the one area with the greatest significant differences were between male and female students. Female students were able to express what they learned better than their male counterparts. This could be attributed to developmental issues. The greater significance between males and females was apparent in fifth grade. This difference needs to be examined. Was it due to two years of HOTS, or a maturation issue, or perhaps both? This suggests the need

for additional research to evaluate the long-term impact on student learning. The coordination of critical thinking activities also needs to be examined to see if this would change the results.

Teacher Perception of Low Achieving Students and Their Abilities

Delpit (2006) suggested that many of the problems encountered when working with low-income African American children can be minimized by a change of teacher attitudes and actions in the classroom to help students achieve their potential. A study by Hillard (1991) revealed that low-income students can achieve high levels of success when teachers change their attitudes and actions in the classroom. Delpit (2006) advocated teaching children more content, not less. She suggested that when we do this, we will see the brilliance within these children. She feels strongly that all students should have access to the basic skills needed to become productive citizens in American society. According to her, the most important thing is not how the children are taught, but for the instructional program to demand the use of high-level critical thinking activities: “A skilled person who is not also capable of critical analysis becomes the trainable, low-level functionary of the dominant society, simply the grease that keeps the institutions which orchestrate his or her oppression running smoothly” (Delpit, 1996, p. 19).

Along with these attributes it is important that we are also aware of the children’s strengths and teach to these strengths. Teaching children should be an opportunity for teachers to connect with their students. One way to accomplish this is through using familiar metaphors and analogies that children already know. When teachers show children that they care about them as individuals, then the students will have a greater opportunity to reach their potential. Willis (1995) reviewed a very successful school located in a low-socioeconomic area where there was an

overwhelming sense of family and found the success rate to be higher than in other similar schools.

“It is thinking that makes reading ours,” said John Locke. If people do not, or are not taught to, think about what they read, it will never have any meaning.

According to Ivy and Fisher (2006), there is a chasm between teaching slow readers the basics and having students read critically. Walmsley (2006) suggested that many students have well-developed basic literacy skills, but they falter when it comes to critical thinking. This problem has become more evident since NCLB was enacted. Walmsley felt this may be one of the causes for the drop in reading scores. Students need to apply critical thinking in finding the correct answers on the standardized tests, and because this is not being fostered, scores drop. Walmsley stated that some children are often exposed to critical thinking prior to entering school. This is particularly true when parents read and discuss stories, fables, and other children’s literature with their children. Once children enter school, the focus shifts to the mechanics of what is being read and how words are formed and placed in sentences. Critical thinking about what is being read is often neglected.

Willingham (2008) felt that the principle task of a student is to learn new facts and skills. He wondered why teachers do not spend time helping students understand how the memory works and showing students how to use their minds to remember the most important fact: “The first principle for students is that memories are formed as the residue of thought. You remember what you think about, but not every fleeting thought—only those matters to which you really devote some attention” (Willingham, p. 18). He felt that it is important for teachers to help students in ways that will have them think about what they are thinking about.

Gettinger (1985) had fourth- and fifth-grade students study a passage of school-related material. Students were told that they should study well and that they would take a test covering the material. Gettinger then repeated the test and determined that the students spent only 68% of the time needed to achieve the targeted score. It was found that what remains in a person's memory from an experience depends on what he or she thought about during the experience. Gettinger found that when students were given strategies to think about what they were thinking about, they had more success in remembering what they were trying to put to memory.

One of the strategies Gettinger (1985) suggested was for students to ask questions after a period of reading, and the frequency of the questioning would be determined by the length of the passage read. The longer the passage, the greater the distance between questions. For example, instead of asking questions after every sentence, they would ask questions after every paragraph or two. This strategy was studied by Wood, Pressley, and Winnie (1990), who found a sizable benefit to memory retention compared with those students who were simply told to read the passage and remember it.

Conclusion

Many studies have been done to investigate the causes of the fourth-grade slump, and many different strategies have been suggested. Yet the fourth-grade slump continues to be a problem. Helping students focus and develop critical thinking skills has been shown to be a tool that could help students overcome the slump. This study focused on student development of higher-level critical thinking activities using materials available to classroom teachers.

CHAPTER III

METHODOLOGY

Introduction

Fourth grade reading scores continue to decline in an inner-city elementary school. The purpose of this study was to investigate the use of critical thinking activities to help fourth grade students avoid the fourth grade slump. This research is being driven by these three research questions:

1. What effect does the use of selected critical thinking activities have on the fourth grade slump?
2. What percentage of the activities must students excel in to avoid the fourth grade slump?
3. To what extent can each activity serve as a predictor in avoiding the fourth grade slump?

Research Design

This is a quantitative applied research project. The beginning of the study started with a presentation to the administration and staff at the school that would be implementing the activities to help students avoid the fourth grade slump. This meeting was arranged six weeks prior to the implementation of the activities. The principal was presented with the idea of including critical thinking activities into the fourth grade curriculum on a daily basis. The presentation to the administration, the two fourth grade teachers and the literacy coach was well received; the principal felt these activities would be appropriate for all intermediate and middle school students.

The principal requested that a modeling of activities be presented to all faculty members and demonstrated in the intermediate and middle school classrooms. The implementation of critical thinking activities was modeled in all grades, first through eighth, except the fourth grade classrooms which was introduced to the activities at the beginning of the study. This modeling was used as a means for training the two fourth grade teachers who would implement the activities in their fourth grade rooms. The reading specialist also offered to be an additional resource in the fourth grade classrooms for modeling and reinforcing how to create good questions. The three activities students were introduced to were:

1. Set Game
2. Create questions from nonfiction books and articles
3. Sudoku activity.

Set Game was one of the activities that was chosen because of its ability to promote problem solving as well as deductive reasoning (Quinn, Weening & Koca Jr, 2009). Chinn and Oliver (1990) felt that Set Game is an interesting and challenging activity for exploring ideas in discrete mathematics which is one of the standards for mathematics in high school. It is also supported by the elementary curriculum to help students master problem solving, communication, and reasoning in mathematics.

Set Game was the first critical thinking activity introduced to the students. The students had one semester (20 weeks) of working on the Set Game. When students had computer lab as one of their extra assigned activities for the quarter, they spent the first 10 minutes of the class working on the Set Game. When students did not have computer lab, they went to the computer room right after morning exercises for 10 minutes and did the Set Game and then returned to their room for regular school

work. Each class had one quarter (10 weeks) in the computer lab and one quarter not in the computer lab.

The development of the skill for students to ask critical thinking-type questions has been proven to be an important skill for students to achieve. A study done by Elder and Paul (1998) found that thinking is driven by questions, not by answers given. They found that questions help students define the issues and often help students ask more probing questions. The conclusion of this study suggests that when students ask questions they are thinking and learning. The second activity focused on helping students to develop the ability to ask probing questions.

At the same time the students began working on Set Game they were also introduced to methods of learning how to formulate questions when reading nonfiction books and articles. The questions were graded on a scale from one to four. A rank of one would be a question in which the answer could easily be found in the reading. A rank of two would be a definition-type question, understanding the meaning of a particular word or group of words. A rank of three would be an inference question, one that the answer could be figured out from the reading but was not directly stated. A rank of four would be a type of question in which further research or reading would need to be done to find the answer. The goal was to have students create type three or type four questions. Materials used included articles from *Kids National Geographic*, books from *Reading from A to Z* and short stories from Edhelper.com.

Sudoku, the last activity to be introduced, is a well known logic activity. Sudoku, invented in the 1700s by the Swiss mathematician Leonhard Euler, was originally a three by three grid. Today it is a popular logic activity that appears in major newspapers on a regular basis. The puzzles are often rated from easy to very

hard. The degree of difficulty is based on the number of given numbers as well as the variety of logical steps needed to help solve the puzzle. When teaching children how to solve Sudoku puzzles, Polya (1973) suggests starting with easier four by four puzzles and gradually undertaking the more difficult nine by nine squares.

The Sudoku activity was not introduced until the fourth quarter due to scheduling conflicts. During the third quarter, the first two activities were introduced. This was also the period in which the students were taking the Illinois State Achievement Test (ISAT). Prior to the ISAT, several interventions were implemented. These were activities that had been used in the school for the last five years. Included in these activities were test prep mock tests, specific skills emphasis, Study Island activities on the computer, and test-taking clues on how to be good test takers. These test-taking skills were presented to the students by a retired teacher who had been working with the fourth grade students since she retired four years ago. The activities conducted by the staff and others were familiar to the students but had not impacted the scores for fourth grade students', they continued to drop from their third grade level.

On the first day of the Sudoku activity students were shown how to fill in the squares using a three by three grid. A few days later the students worked on a four by four grid; they were then finally introduced to the traditional nine by nine grids. Each of the different types of Sudoku were modeled by the homeroom teachers. When some of the students understood the concept they began modeling for other students or working in small groups to help those students who were having difficulty understanding the concept. The students were first given easy level Sudoku puzzles to complete without assistance. The goal was for students to work independently and try to complete as much as possible. Students also used free time to work on their Sudoku

puzzles. If they did not have time to complete them during the school day they finished them at home.

Population

The school in which the study was conducted is an inner-city elementary school located in the Midwest. Ninety-eight percent of the students qualify for free or reduced lunch. The school's population consists of 99% African American and one percent Hispanic. There were 384 students enrolled from grades pre-K to eighth grade. The principal has been the administrator in this building for the last six years. Prior to this assignment he worked at various grade levels for 21 years in the same building in which he was currently principal.

Students in the study included 18 males and 17 females. Two of the students had an individual educational plan (IEP). Thirty-four of the students were African American, and one student was Hispanic. Thirty-one of the students received free lunch, and the remaining four students received reduced lunch. In third grade twenty-one of the students scored on or above grade level in reading according to the Illinois State Board of Education (2007). In fourth grade 15 of the students scored at grade level on The Learning First Reading Test administered in October, 2008. Only nine students scored on grade level in reading on the January, 2009 Learning First Reading Test.

Two fourth grade teachers participated in this study. One teacher had a B.A. in Education and was in her first year of teaching. For the previous 12 years she had worked at the same school as a teacher assistant. The second fourth grade teacher had been teaching for 11 years at the school being used in the study. For the last four years she had been a fourth grade teacher. She had a B.A. in Education and a M.A. in Educational Administration. The third faculty member assisting in the research was

the school's Literacy Coach and had been at the school for the past five years. She had 17 years of teaching experience in addition to her endorsement in Reading. She was also working on her Masters of Education in Curriculum and Instruction.

Data Collection

The questions students created were graded on a scale from one to four. One point was given to questions that could be answered by just looking at a picture or reading a passage. Two points were given to questions involving vocabulary type questions that could be answered by looking in the glossary or a dictionary for the answer. Three- point questions were inference questions, ones that answers were not given directly but when the students used the clues in the text or the picture the answers could be determined the answer. Four-point questions required additional reading or research to find the answer. Using the rubric of four points, the questions were assessed by two independent persons. The number of each question was then tallied and the average number for the picture or reading was then recorded. The students worked in small groups for the first 10 weeks and the number received was recorded for each student in the group. During the second quarter students worked independently. For purposes of this study the independent work was used for measurement.

The Set Game activity was tracked using running records. Each day the students would record the amount of time it took to find the six different sets. Students had up to 10 minutes to complete the task and if the student was unable to complete the task in 10 minutes then the number of sets they found was recorded. The time on task was averaged for the month of May and first two weeks of June this average time was used for statistical analysis.

The Sudoku puzzle was scored on a point system of 0-27. One point was given for each row completed correctly; there were nine rows. Students were given one point for each column, and there were nine columns. One point was given upon successful completion of each of the three by three squares. Since there are nine boxes within the puzzle, a student could receive a maximum of twenty-seven points. This was the original design, however due to time constraints this activity was not used.

Analytical Methods

To help answer the first question: “What effect does the use of selected critical thinking activities have on the fourth grade slump?” A paired-samples t test was used with the Learning First Reading Test. The Learning First Reading Test was administered the last week of January, 2008 and again the first week of June, 2009. The scores from the January to June reading Learning First Test will be analyzed using A paired-samples t test. The study began five weeks prior to the Illinois State Achievement Test. A paired-samples t test was used comparing the third grade ISAT 2008 scores against the fourth grade ISAT 2009 scores

A Person r correlation test was used to help answer the second question: “What percentage of the activities must students excel in to avoid the fourth grade slump?” All three critical thinking activities were tested independently to check for the success rate needed to be successful in each category. The Set Game was tested to see if there is a particular time cut off that is used for success. The questions were analyzed as to the level of questioning needed to avoid the fourth grade slump: one, a right there question; two a definition-type question; three an inference question; and four, a research question. These measurements were used to predict students’ success.

Finally, a multiple regression rest was run to determine the level of proficiency needed on the Sudoku activities to predict how much of a Sudoku puzzle

needs to be completed correctly to identify success. A total of 27 points were available for each Sudoku puzzle: one point for each column successfully completed (there are nine columns) one point for each row completed successfully (there are nine rows), and one point for each nine square box completed correctly (there are nine boxes in each puzzle).

To answer the third question: “To what extent will each activity serve as a predictor in avoiding the fourth grade slump?” An independent sample *t*-test was implemented to rank the importance of each activity to predict which activity will help determine the effectiveness to avoid the fourth grade slump.

Limitations

This study was conducted over a 20- week period or one semester. Because the Illinois State Achievement Test was given five weeks into the study it cannot accurately indicate a true picture of the effectiveness of these activities, however it was still used as an indicator as to the effectiveness of the critical thinking activities. The Learning First Reading Test was administered in June of 2009 and was used as a measurement of success, but only the past three years of data were available for this test. This study was conducted in a low income inner-city in the Midwest. The sample size was small; larger samplings would be needed to validate any findings. Since there were only 31 students available in this school there was no control group which would have helped to validate the findings further.

Critical thinking activities have been a part of education that seem to be missing since the No Child Left Behind bill was passed. Some teachers in low achieving schools refocused their energy to help students pass tests and little time has been allocated for teaching children how to think. This study was implemented to help

understand the role critical thinking activities may have on helping students avoid the fourth grade slump.

CHAPTER IV

FINDINGS AND CONCLUSIONS

Introduction

Fourth Grade Slump has been identified as a phenomenon that sometimes occurs in low achieving schools. That is to say sometimes children in low achieving schools will be on grade level in third grade, as demonstrated on standardized tests, but when they take the standardized tests in fourth grade they fall below grade level and some of these students never recover academically. Chall (1986) coined the phrase Fourth Grade Slump and some researchers feel this is a phenomenon that occurs due to the enactment of the No Child Left Behind Act of 2001. This can easily be disputed because this phenomenon was identified by Loban (1976) many years prior to the implementation of the No Child Left Behind Act.

The purpose of this study was to determine the effectiveness, extent, and predictive value of selected critical thinking activities. Would a different approach to helping students achieve success make a difference? Could using low cost or free materials on a daily basis help students improve. This study was driven by the following research questions:

1. What effect does the use of selected critical thinking activities have on the fourth grade slump?
2. What percentage of the activities must students excel in to avoid the fourth grade slump?

3. To what extent can each activity serve as a predictor in avoiding the fourth grade slump?

Pogrow (1988) did extensive studies and created a program that he tested using students with IEPs who were performing below grade level. He found that he could raise students' academic performance by adding more critical thinking activities into their academic curriculum. One of the reasons many school districts have not adopted his plan may be due to the cost of the program and the continual monitoring which must be done by trained consultants. If free or low cost critical thinking activities were implemented in low achieving schools that could easily be adapted to the classroom environment, would the results be similar to Pogrow's?

One low achieving school in Chicago implemented daily critical thinking activities into the school curriculum for one semester to see if similar results could be achieved. Thirty-one fourth grade students were included in this study. Several other students participated in the activities but were not included because there was not sufficient previous data to include them.

The students worked on Set Game in the computer lab for 10 minutes at least four out of the five school days of the week. If a computer was not available for student use, this activity could be copied onto paper and completed in the classroom. Students were required to find six sets according to specific criteria. When the students first attempted this activity it often took more than 10 minutes to find six sets, however by the end of the study most students were able to find the sets in less than five minutes.

Students were also taught how to write questions concerning what they were reading. The books and articles used for this study were from Reading A-Z or from the website edhelper.com and discovery kids' website. The books or articles were all

nonfiction and were grade appropriate for the students. Creating the four different types of questions was modeled by the teacher in a whole group setting. The reading specialist assisted the teachers in the modeling of creating questions, the students worked in small groups during guided reading for six weeks, then students created the questions independently. The reading specialist also helped the children during their guided reading time to create questions and understand the difference between the four different types of questions. The data collected were concerned only with the questions students were able to create on their own. The students were taught how to write and what the differences were between the four types of questions. The first type of question was a right there; the information could be found in the text they were reading. The second type of question was a definition-type question; they could find the answer in either the glossary or in a dictionary. The first two levels of questions were considered low-level questions. The third type of question was an inference; the text implies the answer but does not give it explicitly. The fourth type of question would be one that would be considered a research question. The reader would have to do further reading or go to other sources to find the answers. The last two types of questions were considered higher-level questions or critical thinking questions.

The third planned activity was Sudoku. This is a mathematical activity that requires reasoning skills. This activity was not successful for several reasons. The students needed a great deal more guidance on how to accomplish this task and the teachers did not have the time to devote to this activity. The timing of implementations coincided with preparing students for the standardized testing and teachers were already being pressured to make sure the students were well-prepared. The teachers ended up sending the Sudoku puzzles home for homework, consequently

one of three responses occurred. The students who did understand how to do the Sudoku puzzle returned them. The students who did not understand how to do Sudoku but who had parents who enjoyed working Sudoku puzzles returned the homework but told the teacher that their parent had done the puzzle. Some of these parents requested additional puzzles because they enjoyed working them. The third group of students were the students who did not understand how to do the Sudoku puzzle and did not have any adults in the home to do the puzzles, consequently the puzzles were never returned to school. The preceding reasons demonstrated why the data from the Sudoku activities were not used in this study.

Findings

What effect does the use of selected critical thinking activities have on the fourth grade slump?

A paired-samples t test was run to compare students' ISAT 2008 ($M = 53.42$, $SD = 24.004$) and ISAT 2009 ($M = 55.48$, $SD = 22.036$) tests. There was no significant difference between the two tests. A paired samples t test was run to compare students Learning First January, 2009 ($M = 41.26$, $SD = 16.534$) and Learning First June, 2009 ($M = 43.34$, $SD = 14.537$) tests. There was no significant differences between the two tests.

Thirty-one students were included in the study; 71% were on grade level according to the third grade Illinois State Achievement Test (ISAT). The same 31 students took the ISAT test in fourth grade and 71% of these students were on grade level. Not all the same students were on grade level; 11% who were on grade level in third grade dropped below grade level and 11% of the students who were below grade

level in third grade were on grade level in fourth grade. The students needed a score of fifty or better to be considered on grade level.

ISAT individual test results

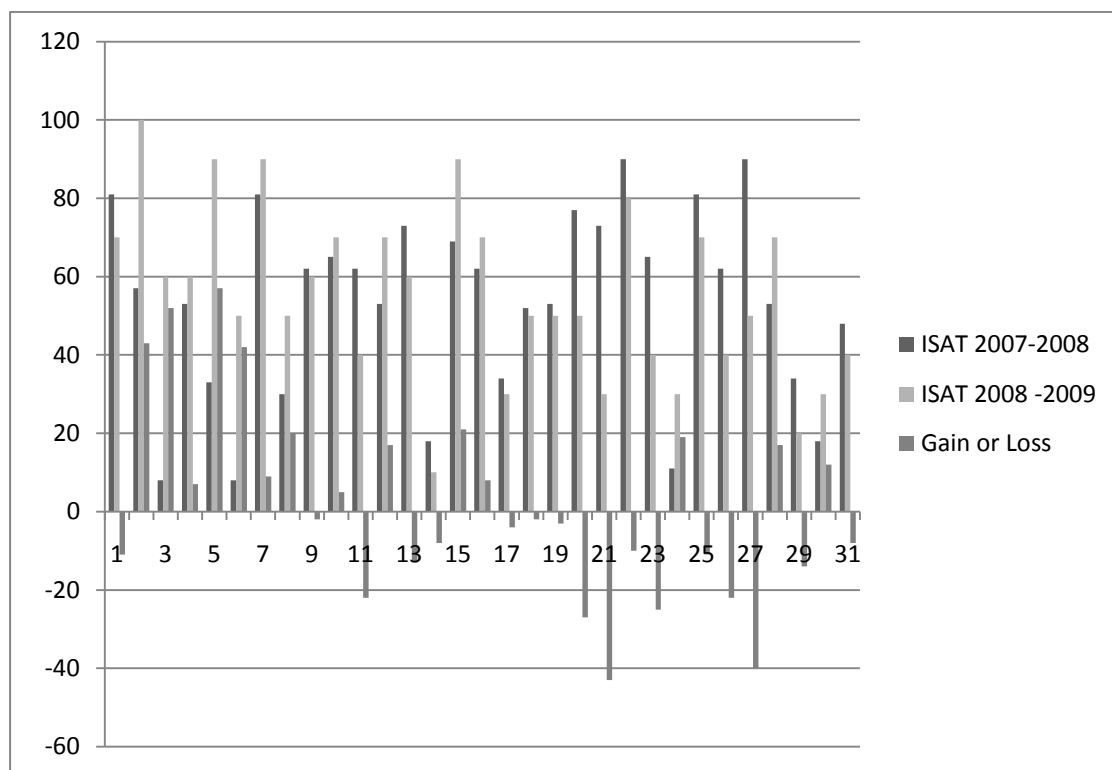


Figure 1 Individual students gains and loss on the ISAT test from third grade to fourth grade.

The third grade class of 2007 – 2008 showed that 57.9% were actually on grade level according to the Illinois State Board of Education Report Card, however because of student transfer in and out of the school, 31 of the fourth grade students took the ISAT test when they were in third grade and again in fourth grade and these were the 31 students included in this study. The discrepancy can be accounted for by students transferring in and out of the state of Illinois which makes past data not available. Only the past four years were included in the data; prior to the 2005 – 2006 school year the ISAT reading test was only given to third, fifth, and eighth graders only.

ISAT Reading Comparison Chart

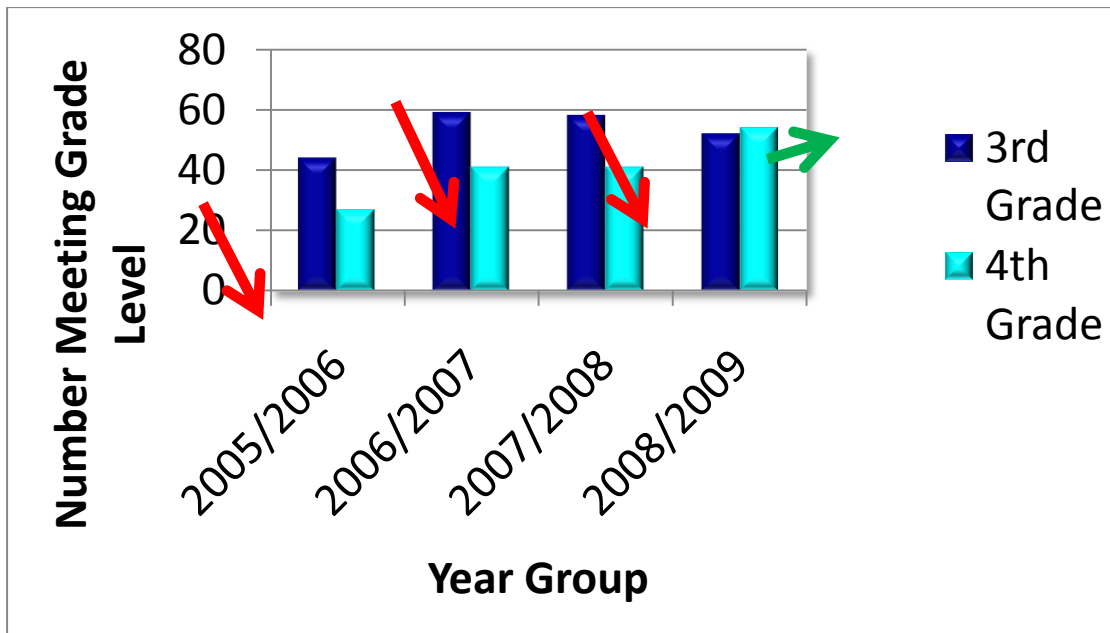


Figure 2 Compares the ISAT reading scores of third graders against the scores that the students received the following year when they were in fourth grade.

The Learning First Reading Test was administered in January, 2009, just prior to the beginning of the study and again in June of 2009 at the end of the study. In January 30% of the students demonstrated the ability to work on grade level in reading. The results for the June, 2009 Learning First reading tests 42% of the students were on grade level or above in reading. Two of the students who were on grade level in January dropped below grade level and five of the students who were below grade level in January were on or above grade level in June. The Learning First may be a better indicator of how successful the students were because it was administered immediately prior to the implementation of the study and again at the end of the study.

Learning First Reading Test Results.

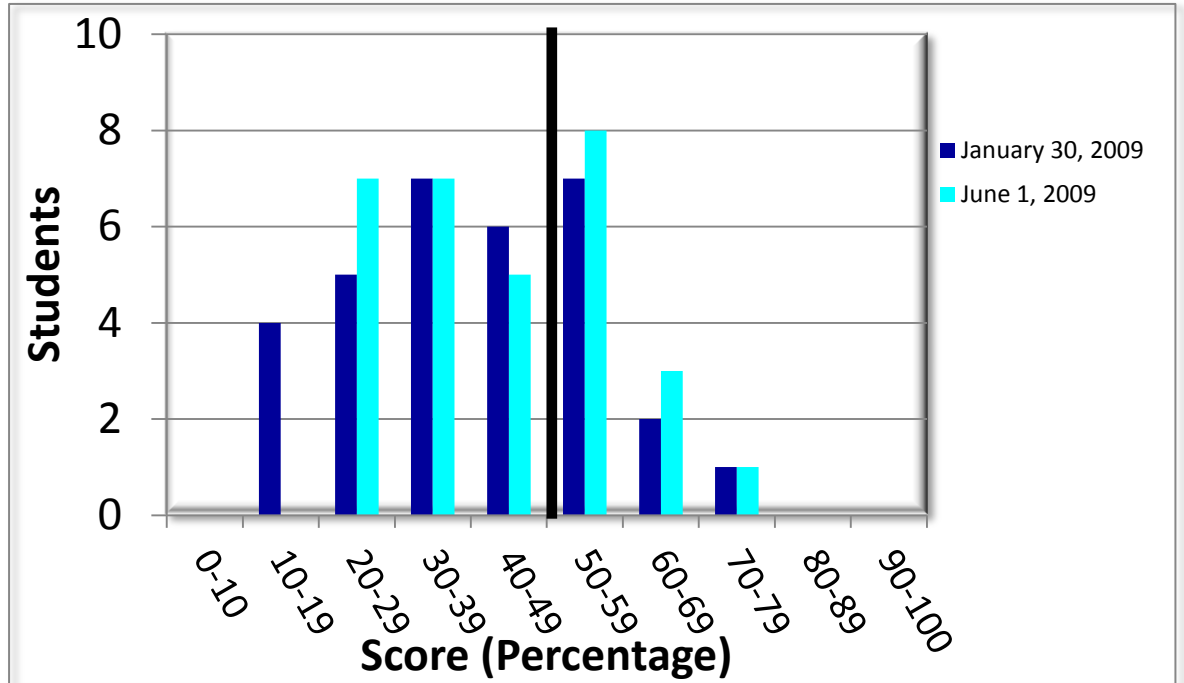


Figure 3 shows the Learning First Reading Test in January, 2009 and compares it with the scores of June, 2009

The students'

Set Game time was averaged for the month of May; all students were able to complete the Set Game activity within a ten minute time frame. Seventeen students were able to complete the Set Game with an average time between two minutes and three minutes fifty-nine seconds. Ten students were able to complete the Set Game with an average between four minutes and five minutes 59 seconds. Three of the students were able to complete the Set Game with an average time between six minutes and seven minutes 59 seconds. Figure 2 shows the relationship between speed on the Set Game and success on ISAT and Learning First Reading Test.

Set Game Time Results

Average Time	Number of Students Average Time
Under 2:00	1
2:00 – 4:00	17
4:00 – 6:00	10
Over 6:00	3

Figure 4 Shows the average time students were able to complete the Set Game and the relationship to achievement on the ISAT and / or the Learning First Reading Test.

What percentage of the activities must students excel in to avoid the fourth grade slump?

The second question asks if there is a certain percentage in each activity that will trigger a level at which children will be successful. The questions were scored according to a student's ability to create critical thinking questions, either inference or research-based questions. Five of the students were not able to create critical thinking questions on their own. They also did not display an ability to work on grade level in either the ISAT or the Learning First Reading Test when they were in third or fourth grade. Four of the students did show an ability to create critical thinking questions but were not able to show grade level achievement on either the ISAT or the Learning First Reading Test. Fourteen of the students were able to create critical thinking

questions and were on grade level for both the ISAT and Learning First Reading Test. The remaining eight students were on grade level as demonstrated on the ISAT but not on the Learning First Reading Test.

A Person r correlation was run to determine if there was a relationship between students' Set Game time and scores on the ISAT 2009 and Learning First June, 2009 test. There was not a statistically significant relationship between either of them. The results for the relationship between ISAT 2009 and Set Game was, $r(28) = 1.00, p > .05$ and the results for the relationship between Learning First June, 2009 and Set Game was $r(28) = .674, p > .05$.

The student success on both the ISAT and the Learning First Reading Test as related to the Set Game activity cannot be determined. Although there is no significant difference between the uses of different critical thinking activities, the results show that 11 out of the 16 students were able to complete the Set Game activity on an average in two to four minutes.

To what extent can each activity serve as a predictor in avoiding the fourth grade slump?

The third question asked if any one of the activities could be a predictor in helping students avoid the fourth grade slump. An independent sample t -test was run comparing the ISAT 2009 and the Learning First June, 2009 with those scores on the critical questions of those who scored 0 (Students were unable to create inference or research questions) and students who scored 1 (Students were able to create inference or research questions). There was no statistical difference. The small sample size plus the ability of 24 out of the 31 students to create inference and/or research questions does provide an indication for student success.

Conclusions

The first question to be addressed concerned the ability of students to remain at grade level or better when using critical thinking activities on a daily basis in the classroom. Although many of the students did maintain grade level success they still experienced a drop in scores, the results may have been different had the students been exposed to critical thinking for an entire school year. This study did have the student working on critical thinking questions both during language arts as well as science and social science classes. The study covered only a relatively short time but the infusion of critical thinking questions may be one of the reasons for the success. There is a strong implication that critical thinking activities can help students maintain success as shown on the standardized tests. Figure 1 shows that 14 students did experience a drop in ISAT reading scores but of those 14, eight remained on grade level and four dropped below grade level. There were 10 students who scored below grade level in third grade and of those ten four were now on grade level, of the remaining six two showed improvement and four had scores that decreased between 4-14 points.

The second question asked if there is a certain percentage of each activity that will trigger a level at which children will be successful. The findings did not appear to demonstrate that any level of any one activity was more advantageous over any other activity or could be used as a predictor for success, however, it appears that the use of critical thinking activities may be the important factor, not the type of critical thinking activity, in helping fourth grade students avoid the fourth grade slump.

The third question asked if any one of the activities could be a predictor in helping students avoid the fourth grade slump. This question would need more data to validate any one activity that could be an indicator for the students' success; this study

only incorporated two activities. The first activity, Set Game, found all students were able to succeed after practice but student success did not demonstrate an indicator of success on standardized tests. Fifteen of the students who were successful were able to complete the activity within a six minute window. On the flip side 11 of the students who were able to complete the Set Game within a six minute window were not successful on either the ISAT or the Learning First Reading Test.

The students who were able to demonstrate an ability to create inference and research questions on a regular basis had mixed results; 20 of the students were on grade level and nine of them were not. The four students who were not on grade level in third grade but were on grade level in fourth grade demonstrated an ability to create inference and research questions. The three students who were not able to construct inference or research questions were not on grade level in third grade according to the standardized test and they were not on grade level in fourth grade.

Implications and Recommendations

This is the first year out of the past four years that fourth grade students in this low achieving school did not experience the fourth grade slump. This study indicates the importance of providing critical thinking activities for these children. Critical thinking activities seem to be called for especially in schools with low achieving students. Students who are exposed to critical thinking skills seem to be able to do better on standardized tests, particularly in fourth grade where the slump has been prevalent. Could there have been other factors within the school environment that also added to the success? There were many activities, one being a new fourth grade teacher who came with new ideas and great enthusiasm that had not been present before. She seemed to be a very effective teacher; this was evident even before the study began. However, she only worked with half the fourth grade students and the

results were evenly divided between the two classes. The before and after school programs were the same as they had been for the past several years; these in combination with the critical thinking activities could also have been a reason for the success. The results on the ISAT test were positive especially because the study had only been implemented for five weeks prior to the testing, which could indicate that there may have been other activities helping students. The Learning First Reading Test given in January and again in June did validate the results; even the students who were not on grade level did demonstrate growth during the time the strategies were in place. More research needs to be done to validate the findings.

There are some changes that I would make if the study were to be replicated. A longer period of time, at least one full school year is the first recommendation. I would continue to break the questions into the four categories but I would have the children create two questions for each of the four categories. The categories would include: right there questions, definition-type questions, inference questions and research questions. I think this would have made it easier for the children to distinguish between the types of questions at the beginning of the study. If the study had spanned over a one year school year, then the Sudoku game could have been included and this may have added to the results of the study. I would also recommend having a control group to make sure the results were due to the activities and not a change in the school environment.

It would be interesting to follow the students to see if they can maintain the achievement level over a longer period of time. How would the students perform if they had been exposed to these types of activities before fourth grade? In addition, a great deal more work needs to be investigated to see if other types of critical thinking activities would be as effective. This study does seem to validate that the type and

expense of the critical thinking activity is not as important as exposing students to critical thinking activities.

It was of interest to note that when school started the following September the fourth grade teachers came and asked if they could continue using the strategies that were in place during the previous year. The need to inform and educate all teachers, but especially the teachers working in low achieving schools, about the importance of using critical thinking activities in their classroom is paramount if they wish to help move their students toward success. These activities do not need to add any financial burden for the school or the teacher. It does not appear that the type of activity is as important as consistency of critical thinking activities.

The students continued to ask to do the Set Game on a daily basis even after the study was over. They really enjoyed the challenge. The teachers got hooked on the Set Game as well; they often came up to the computer lab in the morning to see who could do it the fastest. The teachers were very skeptical about how difficult it would be to teach the students how to create questions. It was a struggle at the beginning, but as time went on and with the support of the Reading Specialist they were able to succeed and had fun challenging each other to determine the person who could create the best research type question.

Students from low achieving schools can experience success when teachers add critical thinking activities to their curriculum. The type or the cost of the activities is not the important factor but rather the consistent exposure to activities that will help students think critically. These activities can be implemented in any discipline, not just in reading. These activities may be more important in helping the students succeed on standardized tests. Rather than spending so much time on teaching students how to pass the test, spend more time on helping children learn how to think.

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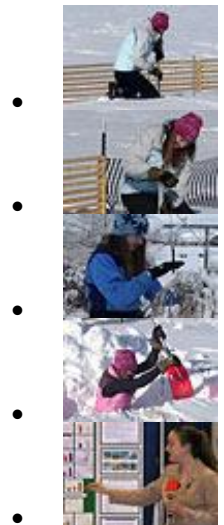
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Appendix A

Sample Articles and books



More Photos:



After each storm, Erica David measured the depth of drifts to compare how her fences captured snow.

Photograph by Elizabeth David

Erica David lives in Pinedale, Wyoming, where winter can bring temperatures of minus 35 degrees Fahrenheit (minus 37 degrees Celsius), howling winds, and one heck of a lot of snow. So it was just natural that she chose to study snow for her school science fair in sixth grade.

Now a junior in high school, Erica is in her sixth year of snow experiments, and is well on her way to becoming a snow expert. She started with a basic question: Could snow fences be built to work better?

Name _____

Date _____

Question 1:

Question 2:

Question 3:

Name _____ Date _____

Oil Spill

By Jennifer Kenny



¹ In 1990, there was an oil spill called the Exxon Valdez. Eleven million gallons of oil spilled. About a thousand miles were hurt by oil. It was very bad. There are still some spots with oil all these years later. Clean-up went on for years. So many seabirds, bald eagles, sea otters, harbor seals, killer whales, and salmon were killed.

² Oil spills happen all over the world. They cause pollution. They ruin the homes of animals. They kill animals and plants.

Question 1:

Question 2

Question 3:

Coral Reefs

A Reading A-Z Level Q Leveled Reader



 **Reading a-z**



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A Busy Underwater Community

When people think of coral reefs, they also think of brightly colored fish—and with good reason. Thousands of fish of all sizes, shapes, and colors live around reefs. They depend on the reefs for both food and protection.

Reefs provide food for **crustaceans** such as shrimp, lobsters, and crabs. Sea urchins and starfish catch clams and other small shellfish hidden among the coral. Flowerlike sea anemones settle into **crevices** to live. Deep holes in the reef are the perfect homes for long moray eels.

Name _____ Date _____













Name of Book _____ Page Number _____

Question 1:

Question 2:

Question 3:

Set Game Sample

			
1	2	3	4
			
5	6	7	8
			
9	10	11	12

Answer to Set Game

7	11	12	Different Color Different Shape Different Number Different Fill
5	10	12	Different Color Different Shape Different Number Same fill
1	9	10	Different Color Same Shape Different Number Different fill
4	9	12	Different Color Different Shape Same Number Different Fill
3	6	9	Same Color Different Shape Same Number Different Fill
1	6	7	Different Color Different Shape Different Number Different Fill

Appendix B
Recording Forms

Set Game Record:

Name _____

Room _____

March 30, 2009 # sets _____ Time:___ Min. _____ Sec	March 31, 2009 # sets _____ Time:___ Min. _____ Sec	No Classes	April 2, 2009 # sets _____ Time:___ Min. _____ Sec	April 3, 2009 # sets _____ Time:___ Min. _____ Sec
No School	No School	No School	No School	No School
April 13, 2009 # sets _____ Time:___ Min. _____ Sec	April 14, 2009 # sets _____ Time:___ Min. _____ Sec	April 15, 2009 # sets _____ Time:___ Min. _____ Sec	April 16, 2009 # sets _____ Time:___ Min. _____ Sec	April 17, 2009 # sets _____ Time:___ Min. _____ Sec
April 20, 2009 # sets _____ Time:___ Min. _____ Sec	April 21, 2009 # sets _____ Time:___ Min. _____ Sec	April 22, 2009 # sets _____ Time:___ Min. _____ Sec	April 23, 2009 # sets _____ Time:___ Min. _____ Sec	April 24, 2009 # sets _____ Time:___ Min. _____ Sec
April 27, 2009 # sets _____ Time:___ Min. _____ Sec	April 28, 2009 # sets _____ Time:___ Min. _____ Sec	April 29, 2009 # sets _____ Time:___ Min. _____ Sec	April 30, 2009 # sets _____ Time:___ Min. _____ Sec	May 1, 2009 # sets _____ Time:___ Min. _____ Sec
May 4, 2009 # sets _____ Time:___ Min. _____ Sec	May 5, 2009 # sets _____ Time:___ Min. _____ Sec	May 6, 2009 # sets _____ Time:___ Min. _____ Sec	May 7, 2009 # sets _____ Time:___ Min. _____ Sec	May 8, 2009 # sets _____ Time:___ Min. _____ Sec
May 9, 2009 # sets _____ Time:___ Min. _____ Sec	May 10, 2009 # sets _____ Time:___ Min. _____ Sec	May 11, 2009 # sets _____ Time:___ Min. _____ Sec	May 12, 2009 # sets _____ Time:___ Min. _____ Sec	May 13, 2009 # sets _____ Time:___ Min. _____ Sec

Rubric for coding questions

1. Right There question – The answer to the question can be found in the passage just read or previous read in the article
2. Definition type Question – Asking for the explanation of any word and could find the answer in a dictionary
3. Inference Question – The answer can be answer by thinking about what has been read and combined with previous knowledge would convey the answer.
4. Research Question – The question would need to be researched further to find the answer.

Name of Book _____				
Student _____				
	Page # ____	Page # ____	Page # ____	Page # ____
Right There				
Definition				
Inference				
Research				

About Trees by Sherry Sterling
An Apple a Day by Katherine Scrapper
Australia by Terry Miller Shannon
Coral Reefs by Paula Schricker
Earthquakes, Volcanoes, and Tsunamis by Elizabeth Austin
Get Moving! All about muscles by Lisa Trumbauer
The Hard Stuff! All about bones by Lisa Trumbauer
How Sound Works by Penny Atcheson
Lighter than air by John Meyer
The Magic of Migration by Judy Braus
Magnetism by Elizabeth Austin
Making Rice by Ting Gee
Martin Luther King Jr. by Bea Silverberg
Mysterious Mars by Chick Garofano
Nature Reuses and Recycles by Molly Wetterschneider
Salomon: A link in the food chain by Lacy Fin Borgo
Salt Rocks! By Joan Linck
The Steam Engine by David L. Dreier

Articles from Kids National Geographic
<http://kids.nationalgeographic.com/Stories>

Cow power

Drinking water: Bottled or from the tap by Catherine Clarke Fox

Follow the leader ...arctic wolf style by Erin Horner

Record-breaking year for ozone hole

Snow fences: How one science fair project snowballs into something big

Aesop and his fables by Vickie Chao

The backwards letters by Colleen Messina

Becoming a citizen by Cathy Pearl

Challenges Immigrants face by Cathy Pearl

Dream catcher – the life of ernie pepion by Colleen Messina

The duryea brothers by Mary L. Bushong

Ellis island by Cathy Pearl

The golden fleece by Vickie Chao

Good clean earth by Mary L. Bushong

How plants and animals are different by Ekaterina Zhdanova-Redman

If you give a manatee a cookie by Vickie Chao

Immigrating by boat by Cathy Pearl

The letter by Colleen Messina

Oil spill by Jennifer Kenny

A painful decision by Colleen Messina

Troy – did it really exist? by Vickie Chao

Why do Immigrants come here? by Cathy Pearl

What is a disability? By Phyllis Naegeli