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An Exploration of Strategy-Based Reading Instruction Using Expository Science Texts in the Elementary Grades

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Abstract: This qualitative exploration was designed to examine strategy-based reading instruction using science expository text in grades 2-5. This study centered on case studies of six elementary teachers and how they used reading strategies during science instruction. Findings revealed that although the teachers' use of expository text was limited, teachers utilized particular reading strategies that extended and elaborated the students' oral discussions during science instruction. The classroom conversations about science topics extended the students' background knowledge of the science concepts that related to science expository text materials in grades 2-5. Further research could include alignment of reading strategy instruction with science instruction using print materials that are matched with the students' instructional reading levels.
Key words: Expository Text; Reading; Classroom Teacher; Comprehension; Strategies

Reading strategy instruction related to expository text in the elementary grades continues to be significant, especially in the content areas such as science. Researchers have concluded that when teachers infuse reading strategies into the classroom, student performance and learning also increase (Forget & Bottoms, 2000; McKenna & Robinson, 2002; Meltzer, 2001; Moore, et al., 1999; Snow, 2002; Tomlinson, 1995; Vacca, 2002). Strategy instruction helps "students develop independent strategies for coping with the kinds of comprehension problems they are asked to solve in their lives in schools" (Pearson, 1982, p. 22). Students in elementary grades require teacher assistance to acquire strategies to comprehend expository text before they leave third grade. Teachers can model the strategies that will help their students with understanding specific vocabulary or use other background knowledge that will help students comprehend the information that is used in expository text materials in the early grades.

Scaffolding instruction from teacher directed to independent learning is comparable to a teaching a child how to ride a bicycle. Children will fall without careful guidance. Teachers must support students towards understanding embedded meanings and information in science text materials. Students need to progress into independent learners in the early elementary grades.

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Comprehension is a process that takes place over time. Good readers actively construct meaning through interacting with what they read, and integrate that knowledge with what they already know. The comprehension process involves making connections with what we already know with what we knew before, during, and after we read new information. Knowledge about science is built piece by piece by accumulating and storing pieces of information that add to our prior knowledge, or schemata. Strategic readers do not memorize new information, but are able to add those new pieces of information to the existing pieces of information that they have already learned. The degree of success in becoming a competent reader is typically established in the early grades (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Juel, 1988; Torgesen & Burgess, 1998). Reading inequities that commonly divide our students are likely to continue (Snow, Burns, & Griffin, 1998) unless students become more competent with understanding expository text in the early elementary grades. This study will address the following research questions:

What reading strategies do elementary teachers use related to expository science text?

How, if any, are there similarities and differences in the use of reading strategies related to expository science text between second, third, fourth and fifth grade teachers?

1. THEORETICAL FRAMEWORK

Although comprehension is fundamental to learning, it is not always explicitly addressed as an important issue in the primary grades' reading curriculum, and the small amount of attention devoted to it is usually focuses on narrative, not expository text (Duke & Pearson, 2002). Furthermore, the few studies on comprehension that have focused on students in kindergarten through grade three have seldom dealt with expository text (Dole, Duffy, Roehler, & Pearson, 1991). This matter is rather disconcerting considering the fact that students beyond grade three enter the world of thicker, denser texts that are expository in nature.

Chall, Jacobs, and Baldwin (1990) refer to the "fourth grade slump" in reading achievement (p. 8). After third grade, students are exposed to denser text used in expository text materials. Without proper attention to the nature of expository text in the early grades, students remain unprepared for the comprehension demands that await them (Bernhardt, Destino, Kamil, & Rodrigues-Munoz, 1995). The nature of expository text requires the student to comprehend print materials with more density as well as specialized content area vocabulary presents different challenges than the traditional narrative text types that use characters in stories with story lines. Since narrative texts are predominantly used in the early elementary grades, often there is limited use of expository text materials for instruction.

Pearson, Roehler, Dole, and Duffy (1992) stress a need for increasing the emphasis of reading comprehension in the early elementary grades. Manzo (2002) explained that the phrase 'fourth grade slump' refers to the large number of students who master initial reading skills, but are challenged by the more complex tasks that are required by subject area texts introduced in the later grades. The fourth grade slump is also referred to as the 'fourth grade cliff,' and Pearson et al. stated "students are falling off because of an overemphasis on decoding skills rather than larger concepts of the big ideas…all those things that literature is about" (p. 15). Moore and Moore (1989) pointed out that there is evidence that difficult scientific concepts are understood better by students who are taught scientific content using literature. This research points toward a need for additional research regarding how teachers need to use reading strategies other than decoding to help students make meaning out of varieties of text, including expository science text.

Children have difficulty making sense of expository text. Sometimes the difficulties are caused by inadequate word recognition, but sometimes they are a function of problems related to comprehension—which Baker & Brown (1984) attribute to a passive approach to the reading task, limited background knowledge, or often, poor metacognition. Both poor and relatively good readers experience problems with comprehension.

Well-structured text that presents information in a clear and logical order is easier to comprehend than poorly structured text (Baker & Brown, 1984; RAND Reading Study Group, 2002). Englert and Thomas (1987) studied four types of expository text structure that included description, enumeration, sequence, and comparison-contrast noting that regardless of the type of structure, older students were more able to use the cues inherent in well-structured text than younger children. Furthermore, Dickson and colleagues (1998) as well as Wong and Wilson (1984) illustrated that good readers are more able to use clues in well-structured text than poor readers. Consequently, there is opportunity for additional research on the elementary level regarding science expository text and text structure.

A few research studies regarding expository text structure at upper elementary level in grades 4-6 have demonstrated the effectiveness of instruction in text structure ; whereas, Armbruster, Anderson, and Ostertag (1987) focused on a single structure, problem-solution. There are a few descriptive studies below fourth grade level. Danner (1976) studied second graders and found that recall and clustering of sentences by topic were greater for topically organized passages than for disorganized passages. Most of the second graders could summarize the main idea of the passages, which indicated that they had basic organizational skills. However, Danner found it difficult to detect and describe differences in passage organization, which suggests that second graders lack awareness of the usefulness for learning and memory. A study by Lauer (2002) with second graders reading problem-solution texts confirmed Danner's conclusions that the children were better able to answer questions about and summarize texts when the texts were well structured.

More recently, there has been an emphasis on a greater presence of expository text in the primary-grade classrooms. Duke (2000) observed 20 first grade classrooms across 10 school districts and found minimal use of expository texts. She emphasized the importance of exposing primary school students to such text. Pappas (1993) reported that emerging readers can recognize expository language and recall the content of expository trade books, and argues that additional exposure to expository materials will enhance these already existing abilities and prepare the children for their work with expository text in later grades.

Duke and Kays (2000) suggested that primary grade students are likely to be suitable candidates for the types of focused comprehension instruction that Dickson (1999) found to be successful with older students. Rather than waiting until the student has finished reading a piece of particular text, we expect students to be able to employ reading strategies that assist them to make meaning of the print, as well as clear up any misconceptions or misunderstandings, confusion, and questions that they have during reading (Harvey & Goudvis, 2007). Keene and Zimmermann (1997) developed some generic questions for reading strategies that included making connections to prior experiences, questioning confusing text, visualizing the text, inferring the main ideas in the text, determining the important ideas contained in the text, and synthesizing the text by sharing new ideas or information gained from the particular piece of text.

National Concern

Perie, Grigg, and Donahue (2005) state that between 1992 and 2005, there was no significant change in the percentage of fourth graders reading at or above grade level in the United States. Societal success though is dependent on students' ability to learn. Lee, Grigg, and Donahue (2007) as well as Snow (2002) contend that our students are falling behind students in other countries on various measures of academic achievement, and in particular, on measures of reading comprehension. Taylor, Pearson, Clark, and Walpole (2003) along with Pressley (2002) conclude that teachers rarely provide instruction on strategies that emphasize reading comprehension. Research indicates that as a result of the national concern about the ability to produce lifelong readers in our society, there is a need for increased teaching of reading comprehension strategies in the content areas that primarily use expository text.

One response to the reading crisis has been the attempt to ensure that every teacher is a teacher of reading, and that reading instruction is not regarded as the sole responsibility of the English and reading teachers. However, we are still awaiting this focus to show significant changes in the ways that content area teachers provide instruction above third grade in the elementary school. Teachers need an extensive and flexible tool kit from which to pull effective practices and strategies, and possessing such a tool kit is critical for teaching content area knowledge and skills. Brozo and Simpson (2007) suggest that effective content area tool kits might be especially helpful to struggling readers and children with disabilities.

Perhaps the most valuable component of the teacher‘s toolkit is a reflective and experimental disposition to use what works in the classroom with a given set of students. Hattie (2003) claims that the teacher, more than any other factor, is the greatest source of variance in student achievement. Furthermore, Brozo and Flynt (2008) claim that this reflective nature is a catalyst for experimenting to discover what works with their students, and Cooter and Flynt (1996) suggest that teachers need to create learning environments that are connected to the real world and carefully constructed to meet the individual needs of their students.

2. METHODS

Observations

Participant observation was selected as the qualitative means of inquiry to investigate strategy-based reading instruction using expository science text in grades 2-5. This research method allowed the researcher to experience the feeling of both being inside and outside the classroom setting at this urban, public elementary school. The researcher observed one second grade, two third grade, two fourth grade, and one fifth grade teacher for 10 weeks for this exploration, including the ongoing activities that occurred in the classroom environment during science instruction and selected activities that were pertinent to this study.

Various record keeping was essential to the exploration, so the researcher collected a detailed record of ongoing events from the six participant classroom teachers who were responsible for teaching all subjects areas. Both objective observations and personal feelings (Spradley, 1980) were recorded. Furthermore, formal and informal interviews served to provide a wealth of insight into classroom proceedings throughout the data collection process.

Written field notes were the primary means in which observations were recorded for later analysis. The researcher used a simple system of keeping a field notebook for the course of the study. Spradley (1980, p. 71) suggests that “qualitative researchers utilize field notes to remind them of events “Like a diary…this journal…contain[s] a records of experiences, fears, mistakes, confusions, breakthroughs, and problems that arise during field work,” that might otherwise be forgotten.

A rating scale for teacher observations, adapted from Ortlieb (2008), provided a repeatable simultaneous technique for gathering information from the classroom observations (see Figure 1). The researcher observed each of the six teachers in order to gain a sense of the teacher’s instructional style, demeanor, the classroom setting, and to sense whether the teacher proved suitable for the study. After the initial observations, the researcher conducted subsequent observations to see how science lessons built upon one another. Classroom observations occurred on various days of the week. Since the researcher explored for both similarities as well as differences among grade levels, written observations were constructed from the observations and field notes for each of the six teachers.

Interviews

An interview with the school principal took place at the beginning of the exploration. Other informal interviews, such as encounters with the principal in the hallway or outside on the sidewalk were ongoing throughout the study. The formal teacher interviews also took place at the onset of the study, and were scheduled in the teachers’ classrooms when students were not present in the room. Other informal interviews with the teachers took place as questions arose during the classroom observations. The collection of data for this study remained flexible and ongoing.

A reading specialist, who served as the math and science coordinator on the research school site, served as a key informant for this exploration. The key informant was interviewed at the beginning of the study. During the study, the researcher had frequent informal conversations with the key informant and the six teachers in the hallways, on the playground, or on the sidewalk, and sometimes in informal meetings about information that pertained to the study. The key informant served as a resource for information about the culture of the research site.

Classroom Teacher: _____ Date:_____

Rating Scale: 1-5
1 never exhibits; 2 rarely exhibits; 3 occasionally exhibits; 4 mostly exhibits; 5 always exhibits

1. bases instruction on data gathered through prior or current reading

1 2 3 4 5

2. models reading strategies for students

1 2 3 4 5

3. scaffolds learners to increase their skill and reading ability

1 2 3 4 5

4. uses verbal communication to enhance the learning environment

1 2 3 4 5

5. implements consistent classroom management skills

1 2 3 4 5

6. utilizes small group instruction during science instruction

1 2 3 4 5

7. designates time for students to read independently

1 2 3 4 5

8. allows opportunities for students to use higher order thinking

1 2 3 4 5

9. individualizes instruction according to needs of students

1 2 3 4 5

Figure 1: Teacher Rating Scale for Classroom Observations

3. FINDINGS

There were several notable similarities between the six teachers in this study. Teacher participants varied in both experience and socioeconomic backgrounds. Two of the six teachers were African American, and four of the teachers who participated in the study were Caucasian. All of the teachers who participated in this study were educated in the same state in which the study was conducted, and their experience ranged from 2 to 14 years of classroom experience.

The classroom settings of each of the teachers were similarly organized, and every teacher had a hand-written poster displayed in their classroom entitled, Strategies that Good Readers Use, including using context clues, checking the picture, and using word parts. The strategy posters that were displayed in each classroom listed nine strategies that good readers use. There were several references to reading strategies during the observations of the science classes, and the six teachers frequently referred to strategies that good readers use in their reading. However, it came as a surprise to the researcher that the teachers did not have focal strategies from the current basal reader series posted in the classrooms. Although all six teachers had the poster within view of all the students in the classroom, and the most of the strategies listed on the poster were research-based strategies, the teachers had not updated the displayed poster to focus on the reading strategies that were used in the current basal reading series.

The researcher questioned all the participant teachers about their use of expository text materials for science instruction. None of the six teachers noted that they used a science textbook. The six teachers in the study voiced their opinion that they felt that the expository text passages in the science textbooks were too difficult for their students to read. The information that the science textbooks were not being used was also verified by the principal as well as the key informant. The science textbooks were located in the teachers' closets, and were displayed in the classroom for the students to use. However, the science textbooks were not used during any of the observations for this study, nor were they ever referred to by any of six teachers in this study. When further questioned by the researcher about why the science textbooks were not used for any of the grade levels, the teachers who participated in this study all answered with the same answer that the science textbooks (adopted two years prior) were too difficult for their students to read. Therefore, the students' exposure to the science text that is correlated to the science curriculum for the state and local guidelines was extremely limited. Although there were extensive conversations and discussions about science concepts and topics, there were minimal connections made to expository printed text.

There were, however, student practice booklets for science, social studies, and math that were used by the teachers for examples of expository text. Often during the study, the teachers utilized the student practice booklets to reinforce the reading strategies that were being used with the particular passages of the text. This was particularly true in the third, fourth, and fifth grade classrooms in which this research study was conducted. Since it was not the researcher's focus, the type of expository text that the teacher chose to use was not an issue. However, the teachers indicated in their interviews that they did not allow student choice of expository materials in the classrooms.

PowerPoint presentations using vocabulary words as well as expository topics and passages were common on all grade levels with all of the six teachers. One difference in the use of materials was with the second grade teachers. The second grade teachers used several versions of the Magic School Bus Series. The Magic School Bus series is a series of videos that uses science expository topics and other nonfiction topics for the focus of the videos. Teachers reported time constraints to fulfill reading and mathematics requirements acted as a barrier for science instruction; still, the researcher noticed that both of the second grade teachers incorporated the use of the Magic School Bus videos into their science instruction at the end of the day. The students were engaged during the Magic School bus videos, and the videos lasted about 15 minutes. The Magic School Bus videos have been cited as some reading researchers as suitable for expository topic discussions. However, the researcher did not note any expository textbooks in the classrooms that correlated with the actual video. There are, however, some Magic School Bus books available for teachers to use in their classroom, and the researcher noticed that there were a few student copies of the Magic School Bus books available outside the classrooms on tables for volunteer readers to use with second grade students.

All six of the teachers in the study participated in the Positive Behavior Support (PBS) that is mandated by the state and was supported by all staff as well as the school administrators on this research site. Evidence of classroom management included certificates of praise for behavior that were displayed outside the teachers' classroom doors. All of the six teachers who participated in this study had a classroom management plan in place, and the discipline management plans were evidenced not only by the student behavior in the classroom, but by the engagement of the students during the science classes that were observed by the researcher. Students were engaged during the discussions that were observed, and the discourse about the science topics was relevant to the science topics identified in the local and state

curriculum standards for the different grade levels. In this case, the second grade through the fifth grade teachers all used questioning strategies throughout the science discussions, referred to several graphic organizers during the discussions, and frequently engaged students in the modeling of the strategies.

Most of the observations were large group discussions. One of the third grade teachers used small group instruction, but the majority of the classroom observations used large group instruction with oral discussions. The classroom discussions had high levels of student engagement, and all six teachers extended the discussions of the students in all grade levels from second through the fifth grade. Field notes from the observations noted that there was 75-100 % student engagement based on student responses throughout the science topic discussions. Although there was a high level of student engagement during the classroom science discussions, the students were limited to the availability of science text for the discussions. The second grade and fourth grade teachers had blue plastic book bins with selections of expository text materials from which the students could choose reading selections, but the blue plastic book bins were not labeled with science topics nor were they set up for student engagement in science center activities during the science instruction.

The third and fifth grade teachers voiced their apprehension of the high stakes standardized tests named iLEAP, and both teachers used student practice booklets for science preparation. The second grade teachers who participated in the study stated that they did not feel apprehension or anxiety related to the high stakes testing like the third, fourth, and fifth grade teachers who were involved in the high stakes testing. The researcher was given a copy of the practice booklets at the beginning of the research study, so the researcher knew that some of the expository text materials would be available in the student practice packets.

All of the six teachers in this study used questioning strategies in their instruction. Most of the teachers, especially the third grade and the fifth grade teachers in this study, extended and elaborated on the students answers during class discussions. For example, one of the fifth grade teachers during her discussion about the moon and the phases of the moon, elaborated on students' responses throughout the period of the classroom observation. Although expository text passages from the fifth grade science practice booklet for the high-stakes standardized iLEAP test were on the students' desks, the expository text was never used during the observation. However, the fifth grade teacher engaged 100% of the students in discussion throughout one particular observation, and the students clarified misconceptions and extended their knowledge of the moon and its phases throughout the observation.

Similarities and Differences in Instructional Strategies

In examining and analyzing field notes, the researcher noticed that the teachers used some similar instructional strategies across the grade levels. Throughout the duration of the study, there was a limited variety of text available to the students in the classrooms. Each teacher encouraged active student participation and student engagement in oral discussions. The classroom discussions in the second, third, fourth, and fifth grade centered on science topics during the science instructional time. All teachers used conversation and discussion. However, when analyzing the classroom observations across the grade levels, the researcher noted that there was a minimal use of expository test materials during science instruction. Elaboration of student discussion and clarifying concepts through oral discussion was evident throughout the study; however, there was a limited amount of expository text print that connected the conversations with printed text or printed vocabulary words. Oral discussion extended the students' background knowledge about science topics.

Upon examination of the six teachers' lesson plans that were made available to the researcher by the principal, the researcher noted that there was a scarcity of teacher lesson plans on file for science instruction. There was, however, an abundance of social studies lesson plans.

The researcher cannot account for the difference in the apparent lack of formal instructional planning for science instruction. For example, the second grade teachers extended conversations about the Magic School bus videos, and the students were engaged in active participation and had several opportunities to participate in the oral discussions that followed the Magic School Bus videos. Since instruction was during the last 30 minutes of the day, it was difficult for the observer to discern whether the strategies that the teachers were using were explicitly taught during the morning reading block. Since the research site is

constrained by federal mandates for reading funding, the morning reading instructional block is structured and has very specific curriculum guidelines.

In one observation, which occurred in mid-day, the researcher observed one of the third grade teachers, Teacher #3, led a science lesson using expository text with a leveled basal reader/ supplemental book. The book was a nonfiction selection using expository text, and the students were able to locate related information. In addition, Teacher #3 was able to elaborate and extend oral discussion throughout the lesson that allowed student engagement, participation, and explanation about vocabulary words or other pieces of information that needed to be clarified using examples of expository text.

The researcher observed third grade, fourth grade, and fifth grade students reading from and writing in individual student booklets for standardized testing. The student practice booklets contained various types of sample questions that used expository text structures. The student practice booklets were usually on the students' desks during the science observations, and referred to often throughout the observations for this study.

Based on observations, the researcher noted with regular occurrence third, fourth and fifth grade students reviewing and preparing for upcoming high-stakes testing. The researcher recognized that the teachers as well as the students were anxious about the anticipation of the testing. It was apparent to the researcher that the science textbooks or other materials had been put away on shelves until after the standardized testing was completed.

Oral reading and discussion strategies were evident through the research study. Teachers in this study combined student conversations and extended class discussions to elaborate about science topics. The majority of the third, fourth, and fifth grade teachers used large group discussions that helped the students connect with prior experiences and build extended background knowledge about the topics.

4. DISCUSSION

4.1 Research Question One

How do elementary teachers use reading strategy instruction related to expository science text in grades 2-5?

Strategy instruction occurs within the context of real reading events. Comprehension strategies are blended into meaning-oriented discussions surrounding text. A teacher initially contributes more than the students in the discussions, through explaining and demonstrating strategic reasoning, and then transfers the responsibility of reasoning to the students. The six teachers in this study regularly transferred the responsibility of class discussions to the students.

McKeown, Beck, and Blank (2009) emphasized that the strategies approach to teaching reading comprehension focuses on the direct teaching of specific procedures, such as summarizing, making inferences, and generating questions, and using them in working with text.

In several of the classroom observations for this study, most of the teachers used a strategy-based approach during the class discussions, but there was minimal evidence that the application of the strategies were extended into connections with text after the strategies had been learned. One important component of strategy instruction is that the students be able to use the strategies in working with expository text materials.

Strategy-based instruction can be viewed from a traditional framework of before, during, and after reading. The strategies approach to teaching reading developed from models of thinking and learning processes, whereas the content approach of teaching reading stems from a model of text processing (Doepker & Ortlieb, 2011). More importantly, the researcher in this study observed that there was little opportunity for the students in Teacher #1, 2, 4, 5, or 6's class to apply their strategies to text. However, Teacher #3 frequently made connections to students' own experiences, previous text that they had used in

class, and reasons why the text was important in their daily life. Some connections that were made to the text at hand helped the students to make text connections that would help them process other texts.

One crucial implication of the processing models is that the learners need to be mentally active to process text successfully (McKeown, et al., 2009). The strategy-based instruction model aims at engendering active student engagement with reading. Most of the teachers throughout this study maintained high levels (over 75%) of student engagement during the classroom observations.

Perhaps the most widely cited recommendation for increasing reading comprehension is increasing explicit instruction in reading comprehension strategies (NRP, 2000). The National Reading Panel's (2000) report highlights eight reading comprehension strategies: comprehension monitoring, cooperative learning, graphic and semantic organizers, story structure, question answering, question generation, summarization, and multiple strategy instruction. While none of the six teachers who participated in this study utilized all eight strategies, between them, the six teachers regularly used most of the reading strategies. One out of the six teachers, Teacher #6, used cooperative learning groups during the observed science instruction, and related the instruction to science expository text about the circulatory system. The researcher noted that none of the other five teachers in the study used cooperative grouping during the science classroom observations. Large group instruction was predominantly used by all six of the teachers in this study.

All of the teachers involved in this study used large group instruction most of the time. Teachers #1 and 2 used large group instruction, but the groups sat on the classroom floor in a large group carpeted area; whereas, Teachers #3, 4, 5, and 6 arranged their classroom so that their students sat in rows of desks that was well-suited to large group instruction. The teachers, as a whole, favored large group instruction during the science observations.

During the observations, Teachers #1, 2, 5, and 6 provided large group instruction using PowerPoints that emphasized graphic organizers to organize the information about the science lesson. There was minimal modeling of any graphic organizers, but the teachers reviewed graphic organizers that the students had used in previous science lessons. For example, Teacher #1 used a flow chart and Teachers #5 and 6 used charts that were cyclical in nature to depict the life cycle of a frog.

Story structure is a strategy that focuses on the five w's (who, what, when, where, and why), characters, and plot. This strategy was not implemented by any of the six teachers for any of the science observations. Although story structure is usually emphasized in narrative texts used in elementary grades, the researcher did not note any use of modeling of analyzing text structure during science instruction related to actual expository text during this study. One possible reason that story structure or text structure was not used during the science instruction is that there was minimal use of expository text throughout the study. Although the teachers in this study maximized the use of conversations and discussion, there were minimal references to actual connections with expository text materials. The use of story structure and signal words in text structure could be an implication for further study.

Question answering was utilized by all six teachers in this study, and throughout most the observations. Although most of the six teachers effectively generated both higher level and lower level questioning strategies using the Bloom's taxonomy of cognitive levels of thinking (knowledge, comprehension, application, analysis, synthesis, and evaluation) to extend or clarify students' misunderstandings, there was minimal use of question generation during the science lesson that evolved from the context of the lesson or topic.

The researcher's observations recorded that all six of the participants in the study used higher level (analysis, synthesis, and evaluation) and lower level (knowledge, comprehension, and application) questions during whole-group discussions about science topics. The six teachers used questioning strategies frequently and effectively to extend discussion and clarify misunderstandings. Most of the six of the teachers have high levels of engagement and student participation during the group observations that involved questioning strategies.

Summarization was a common strategy employed by the teachers during the observations. Students seemed accustomed at looking for the main idea and putting it into their own words. The students were frequently asked to retell a situation in their own words, especially in Teacher #3's class. Teachers #5 and 6 also frequently had students summarize and put ideas into generalizations. In summary, most of the six

teachers regularly used some of the eight strategies that have been cited as the most widely used strategies aimed at increasing reading comprehension, according to the National Reading Panel (2000).

4.2 Research Question Two

How, if any, is reading strategy instruction related to expository science text similar between second, third, fourth and fifth grade? How is it different?

The second research question compared and contrasted how strategy instruction related to expository text is similar between second, third, fourth, and fifth grade. In analyzing the observations and the interviews and observations from the six teachers in this study, the researcher noted that there was minimal exposure to a variety of expository text resources that are available for teachers to use with elementary students in all grade levels second through fifth grade. As Wandersee (2001) has noted, during the past decade, there has been more availability of teaching resources and instructional alternatives. Therefore, teachers have choices about where to locate expository text materials, and they have multiple strategies to select from to assist in teaching expository text structures that complement the sociocultural conversations and discussions that occur during science instruction. However, during the duration of this study, teachers used a limited number of expository text materials, and the majority of the materials utilized in this study by third, fourth, and fifth grade teachers included test practice student worksheets containing expository text.

5. CONCLUSION

Young readers take a step in instruction when they transition between decoding print to more fluent meaning-focused print (Chall, 1996). During the past few years, teachers have been increasingly aware of the need to help students understand the meanings that are embedded in expository test. For students to survive in the 21st Century, they must develop a greater familiarity with expository text to ensure their success as productive citizens. There is a multitude of expository text materials available to even young children. Even the most popular basal reading series now used in schools have components that include leveled readers. Supplemental leveled readers are on multiple instructional reading levels and include expository text topics at all grade levels.

Still, observations of these six teachers showed a limited alignment of the science program at this study site with the basal reading series. The various text structures including description, sequence, comparison and contrast, cause and effect, and problem and solution are well written on the instructional levels of various abilities of students. The leveled readers included in the basal reading component are ideal for exposing the younger students in kindergarten through second grade to well written expository text materials. Those same common text structures are used in the more sophisticated leveled readers for the older students in third, fourth, and fifth grades. The frameworks of the text structures for expository text are almost identical.

Understanding expository text in the elementary grades is necessary for students to connect different types of printed texts with experiences from their own daily lives. Knowledge of the structure of different text genres develops over time, and becomes more complicated in the upper elementary grades. Students need rich exposure to expository text materials and in gaining expertise in understanding expository text. Goldman and Rakestraw (2000) as well as Pearson and Duke (2002) emphasize that students who learn to use the organization and structure of the informational texts are better able to understand and retain the information found in them.

The informational books that are available to teachers are very similar in nature in that they all use the most common text structures that are frequently referred to throughout this study. The second and third grade level informational books provide organizational patterns that allow students to follow an author's message. As text becomes more difficult with dense technical vocabulary pertaining to science instruction in the upper elementary grades, and the type information in the graphs, tables, and other information that is used in expository text, even though the text structures are similar in nature, they are notably more complex and the vocabulary becomes more difficult, as well.

At the beginning of this study, the six participating teachers emphasized that they thought that the science textbooks were too difficult for the students to read, so they did not use them during science instruction. The researcher observed that the teachers did not use informational books for instruction. Teacher #1, however, integrated the basal reading selection with the flow chart graphic organizer depicting the life cycle of a frog. Teacher #3 used an informational reader during one of the observations with the third grade. These are examples of necessary contextual planning that allow for rich student understanding.

The researcher noticed that the teachers used common reading strategies like predictions and asking questions to extend the students' conversations to increase students' background knowledge. The level and variety of the expository text was extremely limited though across the grade levels spanning from second through fifth grade. The easier text structures such as sequencing and comparison and contrast tend to be over-taught, while description, cause and effect, and problem and solution are more challenging and taught to a much lesser degree. As students grow more comfortable with expository text, they will find it easier to move beyond the recitation of mere facts to more meaningful connections with expository text. Those connections to expository text will be useful in linking content with out-of-school events.

Implications for Further Research

Alignment of the elementary science curriculum with the current basal reader programs could offer additional insight about how teachers can integrate additional strategy instruction into the science content area. The two original research questions could be modified and used to examine how teachers use reading strategies with expository text in additional grade levels.

Other research opportunities exist with regard to the cultural aspects of using strategy-based reading instruction with populations of students who have high levels of poverty and how the cultural aspect affects their performance in reading. Opportunities for research also exist in integrating the reading strategies across the curriculum into various content areas. Connecting conversation to visual print and graphic resources can be furthered expanded to research how printed text carries visual information to help students use multimodal texts to convey information about science topics. Future research in the area of using reading strategies with multimodal informational text might be beneficial to build successful readers for the 21st century, and how interaction with print with both the visual and verbal modes might lead to improved reading comprehension.

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