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ABSTRACT

A study examined the effects that a metacognitive strategy, self-questioning prediction, had on the improvement of reading comprehension. The sample included 17 eighth-grade students in a South Amboy, New Jersey middle school. The Gates MacGinitie Reading Comprehension Tests were administered as both pre- and posttests. There were three weekly sessions each consisting of two 38-minute periods of instruction. After the posttest was given, a t-test was used to determine whether or not a significant difference would be found between the means of the tests. The t analysis indicated that the self-questioning prediction strategy had made a positive but not a significant difference in improving comprehension. (One table of data is included; a list of the five steps of the self-questioning prediction strategy, and an appendix of data are attached.) (Contains 36 references.) (Author/RS)

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SELF-QUESTIONING PREDICTION STRATEGY'S EFFECT ON
COMPREHENSION

by

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ABSTRACT

The purpose of this research is to examine the effects a metacognitive strategy, self-questioning prediction, has on the improvement of reading comprehension. The sample included seventeen (17) eighth grade students. The Gates MacGinite Reading Comprehension Tests were administered as both pre and post tests. There were six thirty-eight minute periods of instruction. Each session consisted of two thirty-eight minute periods. Each session was one week apart.

After the posttest was given, a t test was used to determine the significance of differences between the mean of the tests. The t analysis indicated that the self-questioning prediction strategy had made a positive but not a significant difference in improving comprehension. Implications of the findings for future research is discussed.

Acknowledgement

I dedicate this paper to my parents who instilled my thirst for knowledge, to my husband who was the "Wind Beneath my Wings," and to my children who are always here for me.

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According to Vacca and Vacca (1989), the knowledge students bring to learning has important implications for content area reading and that schema theory is important in both reading and language comprehension. These researchers say comprehension involves activating previous knowledge and matching it with the new message. They see textbooks as structured writings, and they claim readers must work with print in order to build meaning.

Davis(1972) concluded that reading comprehension is not a single mental process. There's a composite of five mental skills: recalling word meanings, finding literal information, inference, recognizing a writer's purpose, and following structure.

On the other hand, Vacca and Vacca (1989) said reading is greater than the subskills. "The comprehension process may indeed be a composite of skills, but the skills are so interactive that they can not be separated from one another during reading"(p.21). They claim the skillful use of reading to learn is one of the most important goals of reading instruction.

Reading professionals' concerns for content area reading is evident. Smith and Feathers (1983) argued that strategies are needed for students to understand content materials.

Many researchers have used strategies to try to raise comprehension. Flood (1986) said that comprehension is interactive and constructive. Readers create the meaning. He claimed that children need to make the transition into expository text through direct instruction by the teacher. He asserted, "Children need to be taught directly how to comprehend by being shown how, when, and why to use comprehension strategies.

Champney (1989) concluded that students can read to learn with reading strategies. Strategy interventions are used to show the students.

Graves, Cooke, and Laberge (1983) found that the previewing strategy significantly increased factual and inferential comprehension.

Deshler, Schumaker, Alley, Warner, and Clark (1982) found that older learning disabled students had academic deficits which made them unable to cope with the secondary school curriculum. The University of Kansas Institute for Research in Learning Disabilities (KU-IRLD) adopted a learning strategies approach as the core component of an intervention model, "Strategies Intervention Model."

According to Deshler and Schumaker (1984), there are three major rationales to a learning strategies approach.

First, the development and application of metacognitive skills is related to age; older students do better. Second, students who learn how to learn will learn new skills more rapidly. Lastly, a strategy intervention approach requires students to take responsibility.

Self-questioning when it is used in conjunction with other strategies fosters reading comprehension. This treatment increases students' abilities to use these strategies on materials other than those used in the instructional program (Palincsar and Brown, 1984).

There is significant evidence that middle school students have poor comprehension skills. It has been asserted that if we can teach these students how to comprehend their content area materials, then the students will be more successful learners.

Hypothesis

To provide evidence on this topic, the following study was undertaken: a self-questioning prediction strategy was developed for students to use as a metacognitive plan to attack new material. It was hypothesized that middle school students' comprehension skills would not show significant

benefit from the use of a self-questioning prediction strategy.

Sample

The subjects in this study consisted of seventeen (17) eighth graders heterogenously grouped according to the California Achievement Test given in March, 1992. Two were classified special education-resource room, three were receiving compensatory education instruction, six were grade level, and six were above grade level. All were students of South Amboy Middle School, South Amboy, New Jersey whose total population was 194 in grades from sixth through eighth. The socio-economic backgrounds included predominatly a blue collar working class with a lower-middle class income.

Measuring Instrument

The Gates-MacGinitie Reading Tests Survey E was the measuring instrument employed. The test was developed by Arthur Gates and Walter H. Mac Ginitie.

The Comprehension subtest was given in different forms, 1 and 2, as a pre and posttest to obtain an estimate of the students' comprehension ability. Twenty-five minutes were allotted for this test. This test measured the students'

ability to read complete prose passages with understanding. It contained twenty-one (21) passages in which a total of fifty-two (52) blank spaces were introduced. For each blank space a choice of five completions was offered. The first passages were simply written, but the later ones became progressively more difficult. From this test a raw score was obtained, and a standard score, a percentile score, and a grade-level score were derived.

Procedures

The students were pre-tested with Gates-MacGinite Reading Comprehension Test, Survey E, Form 1, one week prior to the experiment. The results served as a diagnostic tool as well as a pre-test. This pretesting was followed by six, thirty-eight minute instructional sessions. Each session consisted of two thirty-eight minute periods. Each session was one week apart.

During the first session the students were taught the Self-questioning Prediction Strategy, (See Appendix A.) according to the following plan. 1. The instructor discussed the concept of a main idea. 2. The instructor and students read a sample passage after which the instructor identified the main idea. 3. The students were asked to

read a passage and identify the main idea. The instructor gave corrective feedback. 4. The students were asked to read two more passages and identify the main ideas. 5. Upon mastery of the concept of main idea, students proceeded to the self-questioning training. 6. The instructor discussed how a main idea could be changed into a question and be answered. Students were taught to write down their questions and then answer them. 7. Students were taught to predict what would happen next. The instructor modeled the prediction and then asked the students for other predictions. Students were then asked to read a passage and write a prediction. Corrective feedback was constantly given. A fiction story was used.

During the second session, the strategy was reviewed. This time 7th grade Reading Study Skills materials were used.

During the third session, the Self-questioning Prediction strategy was applied to an eighth grade science chapter.

The students were then posttested with the Gates MacGinitie Reading Comprehension Test, Survey E, Form 2.

Analysis of Data

After the data for the pre and post tests were collected, mean and standard deviations were calculated.

The t-test was used to examine these mean scores. The .05 level of significance was used to determine whether or not a significant difference between the pre and post tests was found under the conditions to which they were exposed.

Results

Table one illustrates the findings in the use of the self-questioning prediction strategy on improving comprehension.

Table I

Self-questioning Prediction Strategy's Effects on Students' Comprehension

	Mean	Standard Deviation	t-score
Pretest	37.06	8.75693	
Posttest	40.00	8.49264	.99

N=17

As can be seen in Table I, there was a mean gain of almost three points but that this difference was not significant.

Conclusions and Implications

The data supported the hypothesis of this study that no significant effect on comprehension would be found by the use of self-questioning prediction strategies. Although this study did not show a significant improvement in the students' comprehension as measured by a standardized test, improvement was shown. Sixteen of the seventeen students improved or stayed the same. It should be noted that this level of test did not allow for much improvement by high achievers and that the interval between pre and post tests was only three weeks. On the pretest, eight students scored well above grade level and one student scored on level. This suggests that there was little room for improvement by these students as the test only measured to twelfth grade level.

If unit tests or teacher made tests were used to measure comprehension, comprehension improvement might have been at a much higher level. While the high achievement level of the students at this level and the brevity of the study made it difficult for a significant improvement to be shown on a standardized test, it should be noted that that regression toward the mean was virtually non-existent.

While using this procedure in the lessons, the examiner observed a higher level of interest on the part of the students. The students were more actively involved in the new science lesson and performed admirably on a test of those materials.

Further research employing a different method of testing, using only below level students, or using a longer period of implementing the self-questioning prediction strategy is indicated.

SELF-QUESTIONING PREDICTION STRATEGY'S EFFECT ON
COMPREHENSION: REVIEW OF THE RELATED LITERATURE

Factors in Improving Reading Comprehension

According to Vacca and Vacca (1989), comprehension is the bringing of what the reader already knows to the new material. Most authors write with structure. Perceiving structure improves learning and retention. These researchers claimed that if students are shown how to see relationships, they are in the driver's seat. In content reading the burden is on the reader, so instruction should center on a search for meaning in textbook materials. (Vacca and Vacca, 1989)

Kos (1991) commented that his subjects evaluated reading instruction as either repetitious, uninteresting, too difficult, or too easy. According to Kos, it distanced them from the learning process. She suggested that scaffolding, a learning strategy, may be a more effective instructional approach than the typical approach to reading instruction.

Kos (1991) also remarked that children who fail to learn to read as expected develop feelings of helplessness. She claimed that there are avenues of instruction for the development of remedial teaching strategies. She said that traditionally, reading-disabled students' instruction consisted of breaking reading into subskills with given repetitive practice. Instead of this approach, she backed

Smith (1982) who indicated that reading is a process and is best learned holistically in the context of meaningful print.

Smith and Feathers (1983) observed two middle school and two high school history classes to determine the type of reading assigned. They found that only in the high average classes are prereading activities occurring. They concluded that the reading assignments were neither meaningful nor necessary. According to Smith and Feathers, reading as an active process was not happening. They indicated that a change of instructional approaches was needed.

Strategy Learning

Deshler and Schumaker (1986) found that learning strategies teach students "how to learn" so they can cope with curriculum requirements. For example, a learning strategies approach teaches the skills necessary to summarize materials for a social studies test, rather than teach the actual social studies content. (Deshler and Schumaker, 1984)

According to Deshler and Schumaker (1986), there are three major strands in The Learning Strategies Curriculum. First, there is the acquisition strand which helps students get information from written material. The second strand is

to identify and store, and the final strand includes strategies for written expression.

Deshler and Schumaker (1986) claim "these strategies are representative of the types of learning behaviors required by students to respond successfully to curriculum needs." (p. 585)

Deshler, Alley, Warner, & Schumaker (1983) developed a structured teaching methodology for the acquisition of the strategies. First, the student is tested in a particular area and is informed of his strengths and weaknesses and commits himself to learning a new strategy. Second, the strategy is described to the students. Then, the new strategy is modeled from start to finish by the teacher while "thinking aloud". Next, the student uses verbal rehearsals to learn the steps. After the student knows the steps, he uses them in controlled materials. Then, he practices the skill on materials on grade level. Finally, the student receives a posttest to determine if he has reached a level to use the strategy to cope with the curriculum.

Deshler and Schumaker (1986) claimed that the learning strategy interventions have been tested and proved effective. Over seven years each strategy has been tested, and it has been noted that before training most students

demonstrated limited evidence of strategy use, but once the strategy was implemented, marked gains were shown.

Muth (1987) claimed that internal connections must be drawn among the ideas in the text, and external connections must be drawn between the ideas in the text and the student's prior knowledge. Thus, a strategy that helps students connect the text ideas with their own prior knowledge and experiences is needed.

Specific Strategies

Muth (1987) asserted that much of what middle school students learn comes from content area textbooks. She established that expository text is harder for students to comprehend than the narrative text. She examined the literature on the advantages of three strategies, hierarchical summary, conceptual map, and thematic organizer. Muth found that all three promote rote learning, and can be used for texts with headings; hierarchical summary and thematic organizer promotes meaningful learning; and the hierarchical summary and the conceptual map can be student generated.

Champney (1989) devised an intervention assessment program which allows the student to first try the

assignment; then, if they have trouble, the teacher suggests a strategy; and then, the teacher must ask the student to attempt a second assignment using the strategy. She claimed that this technique allowed her students to become more involved and responsible for their own learning and progress.

Risko and Alvarez (1986) conducted two experiments to investigate the effects of a thematic organizer on poor readers' comprehension and recall. The results of both experiments favor the use of the thematic organizer to increase performance on several measures of literal and inferential comprehension. This strategy facilitated more complete recall of text ideas. It provided assistance for improving students' comprehension rather than a method for developing students' ability in reading comprehension.

Many studies (Ausubel, 1960; Ausubel & Youseff, 1963; and Jones, 1977) have found advance organizers facilitate comprehension. Schema theorists suggest that extending background knowledge and experience prior to reading can enhance the reader's comprehension of difficult concepts (Risko and Alvarez, 1986).

Casteel (1990) tested whether text-material presented in "chunks" or phrases would significantly improve the reading comprehension of eighth-grade students. Low-ability

readers' scores were significantly affected by "chunked" style material, but the high-ability readers' scores showed only marginal or no gain on test scores. This experiment backed (Mason and Kendall, 1979 and O'Shea and Sindelar, 1983) who concluded that all subjects read significantly better in a "chunked" mode, those subjects in the low and middle groups have larger gains.

Ericson, Hubler, Bean, Smith, and McKenzie (1987) presented three content area reading strategies that were successful in their junior high project: anticipation-reaction guides, text previews, and three level study guides. These strategies were taught in both social studies and English classes. Their program, The California Academic Partnership Program, was very successful.

Kresse (1984) used metacognitive behaviors with her math students to improve problem solving. Her strategy was the SQR3- Survey, question, read, recite (which she interpreted as work), and reasoning. She concluded that this was not the teaching of reading nor math but just teaching.

Graves, Cooke, and LaBerge (1983) investigated the effects of previewing difficult short stories on students' comprehension, recall, and attitudes. This study, which included thirty-two eighth-grade students reading at about

the fifth grade level and forty seventh-grade students reading at about third grade level, increased students' comprehension of the story by improving both factual and inferential comprehension. It also significantly increased students' recall of the stories and their scores on the short-answer comprehension test. Results also indicated that students generally liked being given previews of stories and found them useful.

Schumm and Mangrum (1991) said, "If students are to become self-actualizing learners, they must be able to analyze an academic task and then plan actions appropriate for completing it." (p.120) They introduced a framework, FLIP, which helped middle school students examine their reading assignments. Students look for the Friendliness of the text, the Language, the Interest, and Prior knowledge. FLIP has been successfully used with middle school and secondary students as well as college students in developmental reading courses.

Palincsar and Brown (1986) promoted reciprocal teaching as a strategy that promotes both comprehension of text and comprehension monitoring. This program is structured by the use of four comprehension fostering and comprehension monitoring strategies: predicting, question generating, summarizing, and clarifying.

Knight (1990) supported Lyman (1987) that a series of cues that remind students and teachers to ask each other a variety of questions on different types of thinking can help with asking and answering higher level questions. Once the cues were learned, Knight used them to code students' journals. Coding was used in conjunction with Atwell's Reading Workshop Approach (1987). Knight found that coding involved the students visually with a means of motivation and self-evaluation. Once the students become proficient with the coding system, entries increase in length, and responses are varied in content.

Graves and Levin (1989) studied thirty learning disabled students on their ability to first identify and then remember the main ideas. There were three groups: the control group which just learned what a main idea was; the monitoring group who were taught how to self-question in order to monitor and check their progress; and the mnemonic group who were taught to use a mnemonic "keyword method" to create an interactive image between the passage and the main idea. The monitoring strategy was most effective for main-idea finding, and the mnemonic strategy was most effective for remembering the main ideas.

Flood (1986) said "Just as children need direct instruction in learning to write expository texts, they need

direct instruction in learning to read exposition."(p.787)
He presented seven factors which help with comprehension before reading: relate new information to prior knowledge, deal with misconceptions, establish purposes for learning, present new information in manageable chunks, solicit active responses, use transitions from one chunk to the next, and summarize the information of the text. He concluded that mapping, questioning, and rereading techniques should be used.

Other proponents of the self-questioning technique, Risko and Feldman (1986), backed Manzo (1969) and Palincsar and Brown (1984) on the importance of keeping students actively involved in the reading process by self-questioning strategies. Palincsar and Brown (1984) reported that students increased in their ability to perform on independent comprehension measures.

Risko and Feldman (1986) studied three second grade remedial reading students. They taught them questioning techniques and found that even though the students did not adopt the same questioning strategies as their tutors, they were able to self generate their own questions and increase their comprehension scores.

Stevens (1988) tested the effectiveness of four methods for teaching remedial reading students how to identify the main idea of expository paragraphs: strategy training, classification skills training, combined treatment, and control. Those students who received training in strategies for identifying the main idea of paragraphs and related metacognitive strategies improved their ability to identify the main ideas of expository paragraphs. Furthermore, the transfer effect to new content is a particularly important result which showed that training the remedial students in these metacognitive strategies can improve their identification of main ideas of expository paragraphs, regardless of content.

Clark, Deshler, Schumaker, Alley, and Warner (1984) studied the effects of two learning strategies, visual imagery and self-questioning, on increasing reading comprehension. Visual image strategy required the students to read a passage and create a mental image of what they read. The self-questioning strategy taught the students to form questions about the content as they read. The acquisition steps for mastering a strategy were followed. They reported that LD students' use of the strategies resulted in greater comprehension scores.

Self-Questioning Prediction Strategy

Nolan (1991) said "Comprehension difficulties are often related to readers' failure to participate actively in the reading process " (p. 132). He felt that teaching students to be more strategic when they read would increase their understanding of textual information. His study combined two cognitive strategies, self-questioning and prediction. He combined two because there was relatively little research on this combination. His study compared self-questioning prediction strategy with a self-questioning strategy and with a vocabulary-based intervention.

According to Nolan (1991), self-questioning directs the learner's attention to critical aspects of the text. This increases their understanding of the text. Prediction gives a purpose for reading because the readers are actively involved in the reading. Motivation is then increased by the anticipation of discovering whether they are right. Nolan (1991) .

In Nolan's study, the self-questioning strategy group was taught in three sessions. The first session consisted of learning the strategy; the second session consisted of using the self-questioning strategy; and in the third session, the students were given added practice. The self-questioning prediction group had the same first two

sessions, but their third session was used to combine self questioning and prediction. The vocabulary-based intervention group, the control group, were taught the importance of understanding the terms in the passage, and during the second and third session, they used analogies and were given additional practice. Nolan (1991) reported that the combined strategy produced the highest comprehension scores for students at all levels of reading ability. The less disabled readers profited in the same manner as the more disabled readers.

This review indicated that activating prior knowledge and actively involving children in the reading process improves reading comprehension. The use of metacognitive strategies helped in this improvement. The Self-Questioning Prediction Strategy employs both these techniques, so reading comprehension should improve.

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Appendices

APPENDIX A

SELF-QUESTIONING PREDICTION STRATEGY

1. Identify the main idea.
2. Write down the main idea.
3. Think of a question based on main idea and write it down.
4. Answer your question.
5. Predict what will happen next.

Appendix B

Raw Scores

Student	Pre Test	Post Test	Gain or Loss
#1	48	48	
#2	48	48	
#3	45	49	+4
#4	44	49	+5
#5	44	44	
#6	43	43	
#7	42	47	+5
#8	40	44	+4
#9	39	45	+6
#10	38	40	+2
#11	36	39	+3
#12	33	36	+3
#13	32	35	+3
#14	30	30	
#15	27	39	+12
#16	23	23	
#17	18	22	+4