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RETRIEVING STUDENTS' PRIOR KNOWLEDGE OF SOCIAL STUDIES CONCEPTS THROUGH THREE PREREADING INFORMATION-SHARING STRATEGIES

By

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ABSTRACT

RETRIEVING STUDENTS' PRIOR KNOWLEDGE OF SOCIAL STUDIES CONCEPTS THROUGH THREE PREREADING INFORMATION-SHARING STRATEGIES

By

Janet Walker Dynak

The researcher's purpose in this study was to examine differences in various prereading strategies to help students retrieve relevant knowledge through speaking and writing. Three prereading strategies were presented to a group of 21 fourth-grade students over a six-month period of time. The strategies were alternately presented when a new chapter in the social studies text was introduced. For each of the three strategies chosen for this study, the students were asked to write about what they knew concerning a given concept they were going to study. The strategies differed in the amount and type of discussion that took place prior to the writing activity.

The written responses were quantitatively and qualitatively examined when no prior discussion took place; when prior teacher-led, large-group discussion took place; and when prior student-led, small-group discussion took place. The findings indicated that statistically significant total group differences were found among the three strategies for both quantity and quality of words written.

When students participated in a student-led, small-group discussion, more words were written and more exact definitions were cited. When the written responses were separated according to student ability, the quality and quantity variance among strategies was not significantly higher or lower for one ability group over another.

To examine how the students interacted in the student-led, small-group setting, a narrative description was included in this study. Three dimensions were established to help formulate a connection between the type of small-group interaction and the specific small-group task. Transcripts indicated all students spoke during every small-group session. In every session, different viewpoints were expressed. The high achievers spoke the most, and their comments were most often repeated by other group members. The low achievers spoke more as exposure time to the strategies increased.

This work is dedicated to my father, Earl L. Walker.

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CHAPTER I

THE PROBLEM

Background

Learning from one's environment is not a mere perceptual absorption of new experiences, but is dependent on prior experiences producing a background into which the new environmental experiences fit (Hilgard & Bower, 1975). Piaget (1929) called these prior experiences "schemes" or "structures." He used the term "assimilation" to define the process that the learner goes through in order to have a new experience "fit," or become a part of existing cognitive organization. When the scheme or structure is changed or a new cognitive organization takes place, "accommodation" occurs.

A great deal of research has been done which has indicated that a student's existing cognitive knowledge of a given topic of study affects the learning and remembering of information presented in the future. Much of this research has been done in the area of reading comprehension (Anderson, 1977; Ausubel, 1963; Pearson & Spiro, 1982; Schallert, 1982).

Studies done in the area of instructional psychology have helped document that students enter the instructional setting with understandings that can either facilitate or hinder the learning of new subject matter. Teachers cannot assume the students' entering

understandings (Alvermann, Smith, & Readence, 1985; Durkin, 1985; Glaser, 1982; Lipson, 1983; Maria & MacGinitie, 1982; Mayer, 1983; Peeck, van den Bosch, & Kreupeling, 1982; Reyes & Smith, 1983).

Several prereading instructional strategies have been developed to help students retrieve relevant knowledge they may have about a given topic. These strategies have also acted as a measure of students' existing knowledge (Barron, 1969; Graves & Slater, 1981; Holmes & Roser, 1987; Langer, 1984; Ogle, 1986; Vacca & Vacca, 1986). The review of literature indicated that these prereading instructional strategies affect the subsequent learning of only some of the students some of the time (Luiten, Ames, & Ackerson, 1980; Tierney & Cunningham, 1984). The research that has been done in this area most often has evaluated the effect of the strategy to facilitate achievement of students' comprehension after reading a piece of text. Assuming that one of the key purposes of these prereading strategies is to help students retrieve knowledge, there is a need to examine the possible facilitating effect that various strategies have on students' speaking and/or writing about existing knowledge during the prereading stage. In this study, the researcher attempted to address that need.

In addition, most researchers have used contrived texts that are not part of the regular curriculum. The topics used for the studies have not necessarily been relevant to the topics being covered in the classroom. Many times, students have been asked to read something right after the prereading strategy has been presented. To help establish the relevance of the topics, there is

a need to examine various strategies in the classroom, using topics as they are naturally presented over time. This researcher also attempted to address that need.

Using ideas from Langer's prereading plan (1981), the researcher established three variations. Ideas from the PReP model were chosen because they include both the speaking and writing modes of communication to retrieve existing knowledge about a topic. Gage (1986) wrote about the advantages of writing versus just thinking about a topic of study:

> One difference, of course, between writing and thinking is that writing is tangible--it results in a finite product--while thinking is intangible and just goes on and on (or, sometimes, around and around). But this difference is also a reason why learning to become a better writer results in better thinking. Writing is thinking made tangible, thinking that can be examined because it is "on the page" and not all "in the head," invisibly floating around. Writing is thinking that can be stopped and tinkered with. It is a way of making thought hold still long enough to examine its structures, its possibilities, its flaws. The road to a clearer understanding of one's own thoughts is travelled on paper. It is through the attempts to find words for ourselves, and to find patterns for ourselves in which to express related ideas, that we often come to discover exactly what we think. (p. 24)

With each of the three strategies chosen for this study, the students were asked to write about what they already knew concerning a given concept they were going to study.

Some prereading strategies involve only the writing mode of communication. Many strategies, however, involve oral interaction between the students and the teacher. The PReP is one of these strategies. Students giving oral explanations of thoughts concerning a concept may reorganize the material for clearer

presentation and, in the process, may clarify it for themselves (Bargh & Schul, 1980). One problem with teacher-led, large-group or even teacher-led, small-group (PReP) oral discussions is that students often do not get an equal opportunity to explain their thoughts orally concerning a given concept.

> In our observation of elementary school classrooms, the most typical situation we saw was this: The teacher stands in front of the class, asks a question, and waits for one of the children to answer it. Most frequently, six to ten children strain in their seats and wave their hands to attract the teacher's attention. They seem eager to be called upon. Several other students sit quietly with their eyes averted, as if trying to make themselves invisible. When the teacher calls on one of the students (indeed, she or he can only call on one), there are looks of disappointment, dismay, and unhappiness on the faces of those students who were eagerly raising their hands but were not called on. (Aronson, 1976, p. 205)

During teacher-led, large-group discussion, this scenario is often played out. The students learn quickly that not everyone gets an equal turn to contribute to the class discussion. The students who are eager to contribute learn that they must strive to be called on and are disappointed when the teacher cannot do so right at the time they desire to speak. The students who are <u>not</u> eager to contribute learn they can often avoid being a part of the discussion if they try to blend into the woodwork. The review of literature suggested that cooperative small-group discussion has been successful in stimulating students to externalize their thoughts in a more equitable manner (Aronson, 1978; Hallinan, 1984; Johnson & Johnson, 1975; Nijhof & Kommers, 1985; Sharan, 1980; Webb, 1982; Zabaluk, Samuels, & Taylor, 1986). One of the prereading strategies included in this study was using cooperative groups to examine the

interaction that took place. A second strategy employed teacher-led discussion, and a third strategy used no discussion.

Once the strategies had been chosen, the researcher had to decide on a subject area. After reviewing the literature, the researcher chose the content area of social studies. Several investigators have indicated that prereading strategies may be effective in the content areas (Reyes & Smith, 1983; Vacca & Vacca, 1986; Ogle, 1986). Social studies is a subject in which a textbook is used more than 90% of the time, and key concepts are central to the text (Patrick & Hawke, 1982).

Purpose

The review of literature suggested that there is only a lukewarm endorsement for the use of prereading strategies to externalize prior knowledge. Part of the reason may be that most researchers have relied on only a single measure of prior knowledge. They have examined one measure in relation to comprehension achievement scores on a passage read after the strategy was presented. The writer's purpose in this study was to address the need to examine differences in various prereading strategies to help retrieve relevant knowledge through speaking and writing. Perhaps the use of some of these strategies can be validated by studies that examine "how" they operate in a classroom setting over time.

Research Questions

This researcher examined differences among three prereading strategies designed to retrieve existing knowledge about social studies concepts that were going to be covered in the text. How the students interacted during the cooperative grouping task during the third strategy was also examined. The following questions were established to guide the study:

1. When students are asked to write about key social studies concepts, will the written responses of the total group differ among the following three strategies?

    a. When no prior discussion takes place.

    b. When prior teacher-led, large-group discussion takes place.

    c. When prior student-led, small-group discussion takes place.

2. Will the written responses differ among high-, middle-, and low-ability students for the three strategies?

3. Will repeated exposure to the three strategies affect the students' written responses?

4. How do the students interact during student-led, small-group discussions about social studies concepts?

Limitations

This study had four primary limitations. Each limitation is discussed separately in this section.

First, the researcher did not attempt to examine what the teacher did with the written samples that were produced at the end

of each strategy session. One of the key reasons for teachers to retrieve and measure students' prior knowledge is to be able to offer assistance to students when connecting prior knowledge to new knowledge. How the teacher used these measures was not examined. Because the teacher's and/or students' use of the written samples was not considered, the possibility of reinforcing or not reinforcing a given strategy through teacher follow-up was present.

Second, no attempt was made to account for the small-group or cooperative-group work the students had participated in during their previous years in school. The student participants in the study had been in an average of three schools during their five years of schooling. It was impossible to account for the past grouping patterns to which they might have been exposed.

Third, the same group of students and the same teacher were used for all the strategy sessions. This helped rule out some variables concerning differences in participants and classroom structure, but the different concepts that were used for each strategy session were a definite variable. The written responses that were used to examine differences in strategies could vary because the concepts chosen were more or less familiar to the students. The researcher hoped the significance of the concept variable would be reduced because 45 concepts were presented in their natural sequence. In a further attempt to control the concept variable, the strategies were alternated until five sessions of each strategy had taken place.

Fourth, the interactions that took place during the teacher-led discussions in one strategy were not compared to the student-led interactions that took place in another strategy. The written responses that were obtained in all strategies were compared, and the interactions that took place during the student-led discussions are described later in this dissertation.

Generalizability

The student participants in this study were fourth graders. The social studies curriculum used in this study covered concepts and topics that are similar in most school districts throughout the United States. Therefore, the research approach, methodology, and findings may have the most generalizability to this grade level.

The researcher played the role of teacher participant in this study. The researcher was part of the teaching team who instructed the student participants daily. Even though the specific strategies employed in this study were not performed in other subject areas during the course of this research by any team teacher, the researcher's familiarity with the topic of study might cause the findings to be less generalizable to other settings. In an attempt to generalize the teacher/researcher procedure used in this study to other settings, the role of the teacher/researcher is addressed in Chapter V. The researcher's personal reflections as teacher participant are shared to enrich the reader's perspective of this research endeavor.

Definition of Terms

The reader may better understand this study if certain terms are clarified initially.

Cooperative group. The cooperative peer work group has common goals but some divided activities. For purposes of this study, all three group members were expected to contribute with some verbalization. Each group member was expected to play the role of group leader during every small-group-discussion session.

Prior knowledge. Prior knowledge is a group of characteristics that describe and/or define a concept or topic of study to which the learner has already been exposed. Prior knowledge is also referred to as "background knowledge" and "existing knowledge."

Quality. For purposes of this study, quality refers to the degree of accuracy of written response given by the student. The following five identified types of responses were used in this study: (a) overall meaning of the concept stated, (b) more than one characteristic or attribute stated, (c) one characteristic or attribute stated, (d) incorrect response given, and (e) no response given.

Quantity. In this study, quantity refers to the number of words written by a student.

Strategy. A strategy is defined as a prereading information-sharing lesson that is designed to retrieve existing knowledge about a given topic or concept. A strategy is referred to as an "advance organizer" in Chapter II when the research is reviewed. A strategy

is called a "treatment" in Chapters IV and V when the statistical results are analyzed.

Summary and Overview

Chapter I included the background of the problem, the purpose of the study, research questions explored, limitations, generalizability of the findings, and definitions of terms. Pertinent research and literature relating to the subject content of this study are reviewed in Chapter II. The design and methodology used in the study are described in Chapter III. In Chapter IV, the data collected and analyzed for this study are reported and discussed. Appropriate conclusions, reflections, and recommendations for future research are presented in Chapter V.

CHAPTER II

REVIEW OF LITERATURE

Overview

A theoretical perspective from which the question of why prior knowledge is important to learning can be answered is described in the review of literature. This framework is one that comes from cognitive psychology. Next, issues that are crucial to the area of instructional psychology are addressed as they relate to prior knowledge. Studies in which researchers have examined prereading instructional strategies that retrieve and measure prior knowledge are reviewed from a variety of content areas. Finally, classroom grouping patterns are discussed as they relate to prior knowledge and learning. In particular, cooperative-grouping studies are reviewed. Thus, the literature review that follows was used to develop a rationale and theoretical basis for the questions presented in this study. A summary concludes the chapter.

Prior Knowledge and Learning

Cognitive psychologists are interested in understanding the mental processes that take place during an instructional episode or presentation of new subject matter. These mental processes have been referred to for almost a century. In the area of reading, Huey (1908) wrote about an individual's past experiences and how they

"evoke images" when one reads. Sir Frederic Bartlett (1932) talked about the word "schema" as active organization of an individual's past experiences. Gray (1948) recommended that teachers "engage prior knowledge" before using basal reading selections. Piaget's (1929) developmental theory recognizes adjustment of past and present experiences as essential to mental growth.

More recently, Ausubel (1963) defined schema as an abstract knowledge structure. Ausubel's theory of verbal learning states that "cognitive structure is hierarchically organized in terms of highly inclusive concepts under which are subsumed less inclusive subconcepts and informational data" (Ausubel, 1960, p. 267). Based on this, one can assume that the structure of schemata will include information about relationships among components. Meaningful learning proceeds by changing one's current organization of knowledge either by elaborating a subordinate concept or by changing the superordinate structure into which subordinate facts fit.

The similarity between Ausubel's theory of verbal learning and Anderson's (1977) schema theory is obvious. Schallert (1982) stated that it is unfortunate that these two theories have been kept separate and isolated. Anderson, like Ausubel, defined schema as a knowledge structure that is organized by relationship between its components. For example, a "face" schema might partially represent the spatial positioning of the eyes and nose. There are various levels of abstraction within one's schema, however. If someone said, "A face has eyes," he/she would be at a higher level of abstraction than if he/she said, "An eye has a pupil." These levels

of abstraction assume that "eye" is a subschema within the "face" schema and that "pupil" is a subschema of "eye."

In addition to this relationship of components within a person's schema, Anderson stated that there is a correspondence between the relationships and the inferences in the message given. For example, in the sentence "The face has many parts," most people would not get full meaning until they knew what type of face was being referred to. Is the author talking about a person's face? Is the author talking about the face of a clock When the type of face being referred to is understood from the context, a person can conceptualize a framework and relationship of components. So a complete theory of schema activation includes decisions about which schema among many should be called into play.

Pearson and Spiro (1982) stated that "schema inadequacies" often cause comprehension difficulties. First of all, students may lack relevant prior knowledge about a given concept. Next, students may have sufficient prior knowledge about a concept, but they might fail to retrieve it for use. Finally, students might have prior knowledge and retrieve it for use, but they might not be skilled enough to relate to the inferences or conceptual complexities presented. This writer examined and compared prereading strategies that are designed to help students retrieve their existing prior knowledge for use.

Instructional Psychology and Prior Knowledge

Glaser (1982) wrote about the importance of prior knowledge. In the research, Glaser described the following four instructional components designed to link learning to instruction:

1. Identifying the nature of competent performance. An understanding of both the knowledge and cognitive strategies used by individuals skilled in a particular subject matter domain is essential in order to define instructional goals. What understanding do we want students to develop?

2. Specification of the initial state of the learner. Students enter the instructional setting with understandings that can either facilitate or hinder the learning of subject matter competence. Knowledge about students' general and specific subject matter understandings and about their ways of understanding how to learn in different subject matter areas must be understood in order to plan appropriate instruction.

3. Identifying learning transition processes. What conditions for learning can be used to foster student growth from the initial state to competent performance? What kinds of instructional activities and materials will foster learning?

4. Assessment and monitoring. In order to adjust instruction, a means of assessment is needed that can identify discrepancies between the desired state and the state a student has reached. This requires detailed knowledge about the intermediate states in the acquisition of competence. "The usual test scores that provide information only about an individual's relative standing in a group of learners (like percentile ranks and other norm-referenced measures) will not provide the detail necessary for making appropriate decisions." What is needed is diagnostic measures that can "identify faulty information structures and procedural knowledge that contribute to incorrect performance." (p. 301)

In the present study, the researcher most directly addressed Glaser's second and fourth components. Mayer (1983) broke these components down a little further by stating that the learner must not only have relevant prior knowledge, but the learner must

retrieve relevant prior knowledge in order for meaningful learning to take place. Some studies that have examined the development of prior knowledge in relation to learning will now be reviewed. Studies that have concluded that students' prior knowledge is often not retrieved and measured will also be discussed.

Pearson, Hanson, and Gordon (1979) studied second graders using expository text about spiders. They gave a pretest and separated subjects into a strong-schema group and a weak-schema group according to their prior knowledge about spiders. After the students read the story, written at their reading level, they were given a posttest. Pearson et al. found that the strong-schema group scored higher than the weak-schema group on the posttest. They scored much higher when the questions were inferential in nature. This might suggest that students with more developed prior knowledge were able to conceptualize a framework for their ideas in relationship to the context of the passage on spiders.

Voss (1984) pretested college subjects' knowledge about baseball and then had them read a passage of text that described fictitious baseball games. Subjects with more prior knowledge about baseball recalled more of the contents of the fictitious text after reading.

Prior knowledge can hinder student learning as well. Maria and MacGinitie (1982) suggested that teachers must be more aware of the ways students' prior knowledge can misdirect the reading process. They analyzed data by using a case study approach, looking at 36 elementary students' misconceptions about six different science and

social studies topics. Each student's incorrect prior knowledge was then compared with the text that was read, as well as the content of the students' free recall and the students' answers to questions about the text subject matter. The researchers found that students often ignored what did not agree with existing knowledge when reading.

Lipson (1983) also looked at misconceptions concerning science and social studies topics. Third-grade learners' incorrect prior knowledge influenced their comprehension of text. Both average and below-average readers scored higher on posttests when the material read was described as "not known" before the reading or was correct before the reading than when the average and below-average readers were incorrect about a concept before reading.

Peeck et al. (1982), as well as Alvermann et al. (1985), looked at the effect a prior-knowledge prereading activity had on comprehension of compatible and incompatible text. Peeck et al. found that prior-knowledge activation seemed to improve students' comprehension of incompatible information, and Alvermann et al. found that prior-knowledge activation did not improve students' comprehension of incompatible information. These studies had conflicting results. One reason might be the fact that Alvermann et al. used passage content that related to the subjects' science program. Peeck et al. used material that was experimentally contrived.

As Posner, Strike, Hewson, and Gertzog (1979) pointed out, people resist change unless they are dissatisfied with their current conceptions and find a feasible alternative. In the Alvermann et al. study, the students might have had more prior knowledge about the content, as it was something that coincided with their school science curriculum. Perhaps the subjects felt less dissatisfied because the material was presented in a format and organizational pattern to which they had previously been exposed. Also, in "school-like" settings (where the Alvermann et al. study took place), students may assume they need to process only certain types of information, such as new vocabulary words (Roth, 1985). These variables may mediate the effects of an advance organizer and prevent conceptual change.

Both the Alvermann et al. and the Peeck et al. studies agreed that teachers need to give the students tools to help them identify and learn differences between their prior knowledge and the concepts being presented. In the present study, the researcher examined the first part of this recommendation. Three prereading-strategy lessons were compared as to how they helped students retrieve their prior knowledge.

Despite its direct connection to learning, prior knowledge is often not retrieved by the teacher. Reyes and Smith (1983) found that many teachers made erroneous assumptions about their students' previous learning. Teachers often assumed their students had the proper prior knowledge to cover a given topic. The main reason these assumptions are made is that textbooks are used to present

subject matter, and teachers think the textbooks' scope and sequence of new concepts follow a systematic program. Reyes and Smith warned that teachers must be very careful. When social studies textbooks were examined, the researchers found there was no systematic build-up of concepts either within programs or between programs. Therefore, assumptions about concepts that students have previously attained cannot be taken for granted, based on the material that is used. Even in basal reading programs in which the scope and sequence might be more systematic, each student's previous learning is different, based on the diverse schema structures that are brought to various instructional experiences within the same textbook program.

Durkin (1985) observed 39 classrooms in 14 school districts during reading and social studies time for three days. She, like Reyes and Smith, found that teachers did not spend time retrieving students' prior knowledge.

In summary, these studies related the following findings: (a) learners' prior knowledge can facilitate or hinder learning experiences, and (b) teachers cannot assume learners' prior knowledge. Some specific prereading strategies that have been designed to help students retrieve prior knowledge are discussed in the next section.

Prereading Instructional Strategies

Prereading instructional strategies are often called advance organizers. Advance organizers are teacher-directed strategies for

activating and assessing background knowledge (Tierney & Cunningham, 1984). A definition of advance organizers will be discussed and some studies involving the use of these strategies will be reviewed to help provide a rationale for the strategies chosen for this study.

Ausubel's (1980) model for advance organizers is consistent with schema theory, which states that new information is learned and retained to the extent that it can be related to existing cognitive structures. Advance organizers can facilitate learning and recalling in two ways (Clark & Bean, 1982). They can mobilize concepts already in an individual's schema. In addition, they can anchor new concepts to previous experiences so that long-term learning can take place.

An exact definition of an advance organizer has not been determined. Characteristics, rather than a formal definition, are often stated in research (Clark & Bean, 1982; Searls, 1983). Ausubel (1978) wrote that advance organizers should be designed to "bridge the gap between what the learner already knows and what he needs to know so that he can learn the task at hand" (p. 148). Other characteristics of advance organizers are that they must take into account the existing ideas that learners have about the topic, and they must demonstrate the relationship between the ideas learners already have and the new ideas to be learned. Perhaps the definition should be determined by the specific content that is to be presented and the capabilities of the learners.

Advance organizers are often put into two categories. One category considers those strategies that are designed to increase students' existing knowledge and thus teach something new. The other category considers those strategies that are designed to help students use knowledge they already possess (Beck, Perfetti, & McKeown, 1982). Sometimes one strategy can help some students increase their existing knowledge while helping other students use the knowledge they already possess.

The structured overview and the story preview are two popular types of advance organizers that are designed to increase prior knowledge. The structured overview is usually in the form of a visual group, which displays the concepts and relationships represented within a text or a unit within a course. By discussing this graph with students before a unit was studied, Barron (1969) found that high school students were better able to relate new science content to relevant subsuming concepts that had already been learned. The story preview is a series of short statements and one or more questions that provide a link between a familiar topic and the topic of the story that students are going to read. Graves and Slater (1981) found that the story preview provided a frame of reference in which to understand new material in various content areas.

Strategies that help use knowledge students already possess often involve prequestioning. Prequestions have been used most frequently for purposes of assessment. They also arouse curiosity and give the students a chance to consider what they already know (Vacca & Vacca, 1986). There are many forms of prequestioning.

Usually, students are asked to generate ideas about given concepts that are to be covered in a future unit of study.

Holmes and Roser (1987) compared five different types of prequestioning techniques for assessing a reader's prior knowledge. The purpose of the study was to determine which was the best at producing a greater quantity of students' existing knowledge. The subjects were 32 elementary school students who were enrolled in a summer reading program. There were equal numbers of skilled and unskilled readers in the group. The topic used for the study was "snakes." The "free recall" technique asked the students to brainstorm about everything they knew about snakes. During "word association" sessions, the students were asked to think about various words as they would relate to the topic of snakes. The "structured questions" technique gave the students probe questions about snakes. The "recognition" technique requested the students to read a statement about snakes and respond as to whether they thought the statement was true or false. "Unstructured discussion," in which the students might share experiences they had had with snakes, was the final technique explored. Holmes and Roser found that structured questions elicited the greatest quantity of information, but they suggested that all techniques have merit based on the subject content and time spent. It is important to note that quantity was the only measure used. The question of "how" the prequestioning strategies helped the students recall information was not presented.

The word-association strategy was studied more recently by Zakaluk et al. (1986). The technique used in this study was adapted from Noble's work (1952), in which a key word encompassing a main idea of the chosen topic becomes a stimulus word for brainstorming activities. In the Zakaluk et al. study, the students had three minutes to write about a key word. A scoring key was developed based on 253 fifth graders' responses. More value was given to quantity of words written, but some quality decisions were made as to whether the students made correct associations. A high correlation between the word-association scores and the subsequent comprehension performance of students was found.

Langer's (1981) Pre-Reading Plan (PReP) attempts to evaluate the quality of written responses more closely. The PReP is a teacher-directed, small-group instructional strategy designed to help teachers identify what students already know about a topic. The PReP instructional procedure is a three-step written assessment that asks the students to brainstorm what comes to mind about a given topic, to reflect about what made them think of what they did, and to reformulate their writing after a teacher-led group discussion about the topic.

To score these written responses, Langer (1980) identified three topic-specific background-knowledge categories. These categories are based on the work of Bruner (1956) and Vygotsky (1962). The categories are listed as highly organized knowledge, partially organized knowledge, and diffusely organized knowledge. Langer's study done in 1984 tested the PReP activity in relationship

to students' comprehension of text-related content that was read after the PReP activity. The subject content was social studies. The subjects were 161 sixth graders of varying reading abilities. Findings indicated that the measurement is closely tied to students' comprehension of text-related content that was read after PReP. Langer noted that even though the PReP is intended to help students become aware of what they already know about a topic, it may even generate some limited new concept awarenesses through focused group discussion. In other words, PReP is a strategy that might help students increase their existing knowledge, while it helps others to use the knowledge they already possess.

In an attempt to validate Langer's measure, Hare (1982) conducted a study in which sixth graders were asked to free associate about key words from a passage they were going to read about "planets." These written associations were quantitatively scored and then qualitatively scored according to Langer's measure. The scores were then compared to the students' comprehension scores after they read the passage on planets. The investigator concluded that quantitative scores were a better predictor of comprehension scores than was Langer's quality measure. Quantitative scores are quicker to obtain, but perhaps the intended use of the scores should be considered when choosing a form of assessment. How a teacher uses the scores might determine which type of scoring should be employed. If a teacher is going to help students connect existing knowledge to new knowledge, the quality of the responses must be considered.

The identified purpose of this study was to address the need to examine differences in various prereading strategies to help retrieve relevant knowledge through speaking and writing. In this study, unlike most of those reviewed in this section, the facilitating effect was based on the quantity and quality of the written responses done during the prereading lesson. The researcher was not really evaluating the effect of the advance organizer to externalize prior knowledge since the facilitating effect is usually based on the students' achievement after reading a text. There are so many other variables that come into play during the reading stage of a lesson that can affect the results on an achievement test. The beliefs and actions of the teacher and students, as well as the interactions between the teacher and students from the time the advance organizer is presented until the posttesting, all have an effect on the achievement results.

The strategies used in this study involved a writing phase similar to Langer's PReP. To examine differences, the variance among strategies was determined by the amount of student speaking that took place before the writing phase. In one strategy, no discussion was held. This is similar to the Zakaluk et al. (1986) study, which was reviewed earlier in this section. In a second strategy, teacher-led, whole-class discussion was held. Langer's guidelines for discussions were used. To provide a rationale for the student-led, small-group discussion that was used in the third strategy, cooperative grouping patterns are discussed in the final section of this review.

Cooperative Grouping Patterns

Deutsch (1949) developed a theory linking the concept of group to the concept of cooperation. This theory states that an individual's behavior in a group is directly related to the interdependent goals of the group as perceived by the individual. When group members believe they depend on each other and participate equally on the group task, cooperation versus competition takes place. Teacher-led group discussion to retrieve prior knowledge on a given topic usually does not provide for the interdependence or equal participation of group members. As an example, in some situations students who have a high academic standing or status in the class are the ones who are expected to contribute. In other cases, only students who choose to be verbally active in a discussion actually take part (Cohen, 1984).

Students often possess skills that are rarely called upon in a conventional teacher-led, whole-group discussion. The calibre of contributions by students in student-led groups exceeds the calibre of student contributions in teacher-led groups. This was the belief of teachers who observed 13-year-old students talk as they worked in student-led small groups that teachers had set up for various subject-content tasks (Barnes & Todd, 1977).

The interactive value of student-led small groups has been discussed for years. In 1941, Strang wrote that students discover ways of integrating different points of view and winning cooperation by working in small groups. In 1952, Miel did a case study of what

a group of teachers did as they planned, implemented, and evaluated methods of cooperative learning in which students were asked to work collectively in small groups on various tasks in various subject areas. Through examining teacher diaries and running records of class discussions from six different schools, Miel and her associates found that learning was enhanced in quality and amount, for all students, when students were shown how to work collectively in small groups.

More recently, many researchers have examined various types of peer instructional work groups. None of these instructional work groups have been designed or researched for their direct ability to retrieve prior knowledge, but their ability to enhance students' interaction and verbalization of thought has been related to scores on achievement tests. Stodolsky (1984) defined different types of peer instructional work groups. Four of these are described in the following paragraphs in terms of the student interaction that is suggested. To carry Stodolsky's work a little further, four of these work groups are related to current instructional practices, and then research concerning these practices is discussed.

The "completely cooperative" peer work group has common goals and activities; all members are expected to contribute, and a joint product is evaluated. Johnson and Johnson (1975) developed a "Learning Together" method, which is very close to this completely cooperative category. For example, students might work in small, heterogeneous groups to complete a single worksheet, for which the group receives praise and recognition. The teacher initiates the

tasks to be completed by the group. The "Group Investigation" technique developed by Sharan (1980) is similar to the "Learning Together" method, but it calls for the students to take responsibility for deciding what they will learn, how they will organize themselves, and how they communicate to others what they have learned.

The "cooperative" peer group has common goals but some divided activities. All members are expected to contribute, and a joint product is evaluated. "Jigsaw," developed by Aronsin (1978), fits into this category. Each student in a five- to six-member heterogeneous group is given unique information on a topic that the whole group is studying. After the students have read their information, they meet with their counterparts in other groups to discuss their readings. Next, the students return to their groups and teach teammates what they have learned. The group then makes a presentation to the class.

The "helping obligatory" peer work group has individual goals. Group members are required to help each other, and each individual is evaluated. "Student Team Learning" (STAD), "Teams-Games-Tournament" (TGT), and "Jigsaw II" (Slavin, 1985) fit into this category. Students meet in four- to five-member heterogeneously grouped teams to master a set of worksheets or to play academic games. Then each student takes an individual quiz on the material. Individual quiz scores give the team points, and teams with the highest scores are rewarded.

The "helping permitted" peer instructional work group has individual goals, and interaction is voluntary from one member to any other member of the group. Each individual is evaluated separately. This type of grouping pattern is often used when high- and low-ability students are grouped together so that peer tutoring can take place (Peterson, Janicki, & Swing, 1981).

Researchers have found that these various types of instructional work groups tend to promote higher achievement for some students some of the time. This is similar to the findings that were reported about the use of advance organizers.

Some researchers have focused on the interactions of student-led peer groups, in which students give and receive explanations. A correlation has been found supporting the argument that giving explanations helps students learn. This held constant even when high-, middle-, and low-ability groups were considered (Peterson & Janicki, 1979; Webb, 1984). Most of these studies were done in the subject area of math, where students worked together in student-led groups of varying abilities. Achievement tests, given after the small-group work, indicated students who gave explanations about how to complete the task scored higher than students who did not verbalize (Webb, 1982). There have been mixed results as to whether receiving information from others in a peer work group has facilitated achievement. Webb suggested that verbalizing thoughts may have more influence than just listening to others. If this is the case, the verbalization that takes place must be examined, and strategies that promote more verbalization should be studied.

Johnson, Maruyama, Johnson, Nelson, & Skon (1981) did a meta-analysis of 122 studies that were conducted between 1924 and 1981. The results indicated that cooperative learning experiences tend to promote higher achievement than do competitive or teacher-led experiences. This result held for all age levels, for all subject areas, and for tasks involving concept attainment and verbal problem solving.

Research reviewed by Slavin (1980) showed positive results on achievement tests when the "Student Team Learning" or the "Teams-Games-Tournament" methods were used in 28 classrooms. These methods were used at the elementary and secondary levels for at least a two-week period. The students' pre and post achievement tests were measured against those of students who had been involved in teacher-led experiences during that same period. It is interesting that Slavin mentioned the difficulty of showing the facilitating effects of the "Jigsaw" method. Achievement tests are most often used to measure the effectiveness of a grouping pattern. The "Jigsaw" method does not employ an achievement test but uses a form of presentation as the final evaluation. There is a level of subjectivity involved in measuring the effectiveness of the "Jigsaw" method.

In the preceding section of this review, it was indicated that achievement tests should not always be used to measure the facilitating effect of prereading instructional strategies. Neither should achievement test results always be used to show the

facilitating effects of various grouping patterns. The grouping patterns have to be examined for how they work. The type of interaction and the type of task that the students are asked to do must be considered when evaluating the effectiveness of a given grouping pattern. The internal working of groups may differ from the intended work pattern. These differences must be analyzed (Stodolsky, 1984). It may be, for example, that the effects of group level on the self-esteem of a student influence the student's motivation to learn in future learning experiences. Hallinan (1984) wrote about the need to consider consequences of grouping for nonacademic outcomes. Various grouping patterns have been successful in stimulating students to externalize their thoughts, but researchers have not been as successful in establishing a link between the type of group interaction and the specific group task (Bossert, Barnett, & Filby, 1984; Nijhof & Kommers, 1985). Therefore, the interaction between the task and the group structure must be examined in more depth.

As a result of this review, the writer assumed that it is important to allow each student an opportunity to externalize his/her prior knowledge. This enables each student to organize and connect existing knowledge to new learning. The cooperative peer group model, in which each student-led group has common goals and each member is expected to contribute, might regulate more equal externalization than the other grouping patterns discussed. Because of the potential of this model to involve the maximum number of students and yet allow for some divided activities in which the

students individually write about the concepts, the researcher employed an adaptation of the cooperative peer group model for the student-led, small-group strategy sessions.

Summary

In reviewing the literature, the writer explored the topic of prior knowledge and its relationship to learning. Many researchers have concluded that learners' prior knowledge can facilitate or hinder their learning experiences. Teachers cannot assume prior knowledge of various content areas.

Several prereading strategies have been developed to retrieve and/or measure students' prior knowledge. These strategies have been studied, but the results have been mixed as to whether or not these strategies facilitate later reading comprehension. This writer suggests that the facilitating effect of the prereading strategy should be measured by examining the knowledge that is retrieved. In other words, this researcher focused on the prereading stage. No attempt was made to relate the prereading stage to the postreading stage.

Students can retrieve prior knowledge through speaking and writing. Researchers have suggested that the more opportunities students have to speak and write about what they know concerning a topic of study, the better chance they have to use the knowledge during subsequent lessons. This investigator examined differences in three prereading strategies to help retrieve relevant knowledge through speaking and writing.

The methodology employed in this study is presented in Chapter III. The participants are described, procedures for collecting and analyzing the data are explained, and methods of reporting are defined.

CHAPTER III

METHODOLOGY

Introduction

This chapter is divided into four sections, in which the methods used in conducting this study are described. First, the participants are identified, and the environmental context in which the study took place is considered. In the next section, the procedures used during the course of the study are described. Then the data-gathering measures are explained. Finally, the rationale for the descriptive and statistical treatment of the data is justified. A summary concludes the chapter.

Participants

The teacher/researcher participant had more than ten years of teaching experience at the elementary level. In addition, she had been an instructor at the college level and a reading curriculum director. At the time this study took place, she was team-teaching in the fourth grade. The school was an elementary school in West Germany, accredited by the North Central Association. This means the courses of study paralleled those of stateside public schools, and standard textbooks published in the United States were used throughout the curriculum.

There were 21 student participants in the study. These fourth-grade students were from families in which one or both parents/guardians served in the United States military or worked as civilians for the Department of Defense. The usual tour of duty in Germany is three years; thus, the population of the school was very transient. The students were chosen because they would be remaining in the classroom from January 1989 through June 1989, when this study was conducted. The students had lived in an average of three other locations in addition to their placement in Germany. All but two of the students had been born in the United States. All but one of the students lived in government housing at the time of this study. These students' travel and living experiences were possibly more similar than those of other populations, and this might influence replication of the research.

Parents or guardians of each selected student were informed of the study and given the opportunity to ask that their child's writing samples not be included.

Procedures

The observation sessions for this study took place in the classroom. The area of social studies was chosen for the information-sharing strategy sessions. Reyes and Smith (1983) found that, when social studies textbooks were examined, there was no systematic build-up of concepts either within programs or between programs. Therefore, assumptions about concepts that students have previously learned cannot be taken for granted, even if the students

have been in the same program of study. Students' existing knowledge about the topics covered in social studies might be more varied than in other subject areas. Because all three strategies compared in this study are designed to help students externalize their varying knowledge about a given concept, social studies was chosen as the subject area. This content selection does not imply that the strategies might be less useful in other subject areas.

The students were heterogeneously grouped for social studies. Social studies was consistently covered for about 40 minutes between 9:00 and 10:30 a.m. each day. This was held constant during the course of the data collection so that time of day was not considered a variable. It must be noted, however, that the structure of the school day surrounding social studies often varied. Because special programs or field trips could not be controlled, these things might have caused varying degrees of motivation and/or concentration on the part of the participants.

The study took place from January 1989 through June 1989. Three different information-sharing strategies were alternately done with all participants whenever a new unit or chapter in the textbook was going to be introduced. A major consideration of this study was that the data were gathered as a natural part of the course of study and not in a contrived situation. The textbook used was Regions Near and Far, published by D. C. Heath and Company in 1987. This was the first year of its adoption, and the teacher had attended a one-day workshop on the use of the manual. After using the series for three months, the teacher/researcher chose three key concepts

from the next 16 chapters or sections of the textbook. Approximately 75% of the words were recommended by the teacher's manual as "new vocabulary." The other concepts were taken from chapter headings. The dates of the strategy presentations, as well as the concepts used, are listed in the Appendix.

The three strategies were alternated, beginning with the first lesson, until five sessions of each lesson had taken place. A pilot session of Strategy 3 was done in late December. This gave the students and teacher experience with the procedures. The information collected during this session was not included in the formal data analysis for the study. The third lesson was chosen for the pilot session because it included the tasks of breaking up into small groups, using group leaders, and operating tape recorders. During this pilot session, the students were placed in the small groups in which they would remain during all subsequent Strategy 3 sessions. Seven groups of three students each were formed. Each group had a person who was considered a high achiever, a middle achiever, and a low achiever. The achievement levels were based on total reading scores from the California Test of Basic Skills. Each group had a student who scored above the 70th percentile, a student who scored between the 40th and 70th percentiles, and a student who scored below the 40th percentile. The standardized test had been given in fall 1988. The reader is reminded that this writer did not consider the amount of small-group work to which these students had been exposed in their previous school experiences. This must be

considered a limitation. During the course of this study, however, an attempt was made to examine whether exposure to the strategies over time might have changed students' written responses and/or patterns of verbalizing.

At the beginning of all strategy sessions, the students were told they were going to be asked to talk and/or write about what they already knew about some of the key concepts that were going to be covered in the next chapter of their social studies text. They were told the title of the chapter and directed to think about the title as they went through the lesson. The next part of the strategy varied according to the particular strategy that was presented. The verbal and written directions for all three strategies were presented separately.

To begin Strategy 1, the students were directed to get out a pencil and piece of paper. The teacher wrote the sentence: "Write about anything that comes to mind when you hear the word [Concept 1]." The students had three minutes to write. At the end of the three-minute period, the teacher asked the students to finish the sentence they were on and to stop writing. Concept 1 was erased from the sentence on the board, and Concept 2 was put up. The teacher read the sentence containing Concept 2 to the students. Then the students were asked to write for three minutes. Concept 2 was erased from the sentence and Concept 3 was put up. Once again the teacher read the sentence and asked the students to write for three minutes. The papers were then collected. This ended a Strategy 1 lesson.

To begin Strategy 2, the students were asked to think about Concept 1 as it was stated and put on the board by the teacher. The students were directed to raise their hands if they had something that they wanted to share about what came to their minds concerning Concept 1. The teacher called on random volunteers for three minutes. The students were told to repeat their information if the class could not hear. This was done so that the teacher did not intentionally or unintentionally alter the information presented by the student. After three minutes, the discussion was stopped. Concept 2 was put on the board, and the students were again asked to raise their hands to share information. After three minutes, the same procedure was followed for Concept 3. Then the students were asked to write about each concept, following the directions stated for Strategy 1. The papers were collected. This ended a Strategy 2 lesson.

To begin Strategy 3, the students were asked to break into their small groups and to get the tape recorders ready. They were told to decide who was going to be the leader for each of the three concepts. The teacher wrote the sentence: "Talk about anything that comes to mind when you hear the word [Concept 1]." The students were reminded to have the leader read the sentence from the board, then begin the discussion by calling on another group member. A group member could make a comment or "pass." The leader was to make sure everyone was asked to share information. During the small-group discussions, the teacher did not make a comment other

than to direct a group to restate the sentence from the board when discussion in a particular group had ceased. After three minutes, the teacher asked the group to wrap up the discussion and get ready for the next concept. The same procedure was followed for Concept 2 and Concept 3. Then the students were asked to write, following the directions established in Strategy 1. The papers were collected after the writing period for all three concepts. This ended a Strategy 3 lesson.

The measures used to examine differences among these three strategies are defined in the next section. These measures included the written responses from all strategy sessions and the audio tapes done during Strategy 3.

Measures

Written Responses

The written responses from the 15 sessions were used to compare the three strategies for the total group of 21 students and for the three ability groups of seven students each. The teacher participant and another teacher scored the written responses. Interrater reliability was established. The dimensions of quantity and quality were created to examine how much the students wrote and what they wrote.

To get a quantity score, the number of words written about each concept was counted. This calculation gave an individual score for each of the 45 concepts. All words written were counted, except when the student wrote words such as "I don't know" or "nothing

comes to mind." These responses were counted as zero words written. Misspelled words were counted. If the teacher could not decipher the word, the student was asked what the word was. This was done so the student's intended meaning could be used when giving a quality score.

Obtaining a quality score was more difficult. Parts of the Langer (1980) model were used to help establish the criterion for scoring. Langer identified three topic-specific categories to assess students' organization of background knowledge. The model suggests three hierarchical levels: highly organized knowledge, partially organized knowledge, and diffusely organized knowledge. The researcher attempted to give less of a hierarchical rating of the responses. The design of the study allowed the students only three minutes to write about each concept and no opportunity for their verbal responses to be scored. Therefore, no attempt was made to label the level of organization of the responses. Using some of Langer's specific subcategories, however, the raters examined the papers and scored the responses written for each concept as shown in Table 3.1.

A hierarchy was still present in that the treatments were compared to see differences in the numbers of each of the five responses given. For example, it was assumed that overall meanings were a more favorable written response than an error or no response at all. All responses for multiple-meaning concepts were counted as "correct." For instance, when "jelly" was written for the word

petroleum, it was given a score of 3 because it can be a characteristic when thinking about petroleum jelly.

Table 3.1.--Scoring of written responses.

Score	Type of Response	Example for Concept--"Plantation"
1	Overall meaning of the concept stated	"A plantation is like a mansion a long time ago during the civil war and it often has a farm."
2	More than one characteristic or attribute stated	"It's a big farming land in the South."
3	One characteristic stated	"It is something to do with farming."
4	Incorrect response	"It has to do with the planets in space."
5	No response	Left blank or "nothing comes to mind" comment.

Audio-Tapes

The audio-tapes of the small-group discussions, which took place during Strategy 3 sessions, were used to describe how the students interacted. To understand better the interaction in relation to the cooperative task that was given to the students, three dimensions were chosen to examine the transcripts from three of the seven groups. The three groups were randomly chosen. The researcher transcribed the tapes and used them as the measure to explain narratively the interactions that took place.

Method of Reporting Results

The written responses from all strategy sessions were scored, coded, and fed into the IBM computer for statistical analysis to help answer the first three questions of the study. The audio-tapes from the small-group discussions were transcribed, and patterns of interactions were described in narrative form to help answer the fourth research question. In this section, the questions that were constructed to guide the study are presented. Following each question, the specific statistical and descriptive treatment of the data is justified.

1. When students are asked to write about key social studies concepts, will the written responses of the total group differ among the following three strategies?

   a. When no prior discussion takes place.

   b. When prior teacher-led, large-group discussion takes place.

   c. When prior student-led, small-group discussion takes place.

The quantity and quality scores from the written responses showed characteristics of a profile analysis in that the same students were used for the three strategies. Because each strategy was presented five times, however, the variables were really measures of the same items across occasions. Therefore, a multivariate set-up was used, with a repeated-measure design calculated over time. The quantity and quality scores were run separately and are presented separately in Chapter IV. It is

important to examine these dimensions in isolation to help determine more specific differences among the strategies. The Wilks multivariate test results and the means and standard deviations were used to indicate significance.

2. Will the written responses differ among high-, middle-, and low-ability students for the three strategies?

The treatment of the data was similar to that for Question 1, but specific groups of students needed to be examined separately to answer Question 2. Therefore, a factorial repeated-measure design was calculated over time. Because there were only seven students in each group, a univariate mixed model along with the means and standard deviations was used to make fuller use of the data. In addition, an attempt was made to rule out an effect between treatment and ability by using the Wilks multivariate test. Both the univariate and multivariate tests were done for the dimensions of quantity and quality.

3. Will repeated exposure to the three strategies affect the students' written responses?

A repeated-measure analysis was used again to help answer this question. Here, the five specific sessions of each strategy were the variables considered. This was done to examine whether the students' written responses changed as they became more familiar with the treatments. The Wilks multivariate test and the means and standard deviations were used to show significance. The dimensions of quantity and quality were calculated separately.

4. How do the students interact during student-led, small-group discussions about social studies concepts?

Three dimensions were established to examine the transcripts and to describe the students' written references to these dimensions in narrative form. This question relates to the other questions when the following statement is considered: If students might benefit from student-led, small-group discussions before being asked to write about a given concept, the type of interaction that takes place needs to be described. Because the review of literature suggested that small-group interaction needs to be examined as to "how" it operates (Bossert et al., 1984), this writer attempted to explain some of the processes that occurred during Strategy 3. The narrative form of analysis was considered the most appropriate way to examine how the interactions took place. An attempt was made to relate the students' comments to the task they were given to do. The researcher did not attempt to relate the comments made during the discussions to the written responses or to the teacher-led discussions during Strategy 2. As the study progressed, both these comparisons were deemed important; thus, the absence of the drawing of such relationships in Strategies 1 and 2 must be considered a limitation of the study.

The first dimension examined whether all the participants were given a chance to share information. The rationale for this dimension was that the review of literature suggested that cooperative, small-group activities might help more students verbalize (Nijhof & Kommers, 1985).

The review of literature suggested that small-group discussions might allow students to integrate different points of view into one discussion (Webb, 1985). The second dimension examined whether different points of view about given concepts were presented during the discussions.

The third dimension described the high achiever's role in relation to the verbalization that took place between all group members. The review of literature suggested that higher achievers are often seen as experts in the group setting (Cohen, 1984).

In Chapter IV, samples from the transcripts are shared to relate the dimensions to the actual conversations that took place.

Summary

The methodology involved in conducting the study was described in this chapter. The teacher and 21 student participants were identified.

Procedures and measures used to show differences in three prereading, information-sharing strategies were explained. Then statistical treatment of the data collected during the strategy sessions was discussed in relation to the first three research questions. These questions were developed to help indicate which strategy might better help students externalize their existing knowledge about a social studies concept that was explored in class.

Procedures and measures used to examine how the students interacted in small groups during Strategy 3 were explained. Descriptive analysis of the data was discussed in relation to the

specific task the students were asked to perform. In Chapter IV, the data are presented and analyzed.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The purpose of this study was to collect, analyze, and compare data regarding three different information-sharing lessons that were performed over time in the social studies class of 21 fourth-grade children from January until June 1989. Differences among the strategies could be beneficial in helping to identify characteristics of classroom lessons that might help students externalize their existing knowledge through speaking and writing. When results are reported, strategies are referred to as treatments.

In this chapter, the data collected from the students' written responses during all treatments are related to the first three major research questions. The interrater reliability was relatively high (.90). The level of significance for all tests was set at .05. The student-led discussions held during Treatment 3 are examined descriptively and related to the fourth major research question. A summary follows the results for each question.

Research Questions and Analyses

1. When students are asked to write about key social studies concepts, will the written responses of the total group differ among the following three strategies?

a. When no prior discussion takes place.

b. When prior teacher-led, large-group discussion takes place.

c. When prior student-led, small-group discussion takes place.

To examine treatment effect over time, a repeated-measure analysis was completed. The results also have characteristics of a profile analysis because there were three treatments, versus the one treatment of a normal repeated-measure design. The dimensions of quantity and quality will be examined separately as they relate to the major question. The same 21 subjects were measured on several occasions. Thus, multivariate tests of significance were used to answer this question.

The first dimension examined the difference in the quantity of words written among the three treatments. The results were statistically significant, thereby providing evidence of a difference in the quantity of words written during the three treatments. The Wilks multivariate test was calculated ($F [2,19] = 7.873$, $p < .004$). There were no significant differences between variances. Using the means and standard deviations reported in Table 4.1, the contrast among treatments was examined. Treatment 3 had the highest mean scores. The smallest difference was between the means for Treatment 2 and Treatment 3. The greatest difference was between the means for Treatment 1 and Treatment 3.

Table 4.1.--Entire sample quantity scores (N = 21).

	Treatment		
	1	2	3
Mean	9.20	10.82	12.25
Standard deviation	(3.61)	(4.59)	(3.85)

$p < .004$.

Note: The higher the quantity mean value, the more words were written by the students.

The second dimension examined the difference in the quality of written words among the three treatments. The results were statistically significant, thereby providing evidence that there was a difference in the quality of the three treatments. The Wilks multivariate test was calculated ($F [2,19] = 64.158$, $p < .001$). There were no significant differences between variances. Using the means and standard deviations reported in Table 4.2, the contrast among treatments was examined. Treatment 3 mean scores reflected that more concept characteristics and/or overall meanings were given. The smallest difference in means was between Treatment 2 and Treatment 3. The greatest difference in means was between Treatment 1 and Treatment 3.

Table 4.2.--Entire sample quality scores (N = 21).

	Treatment		
	1	2	3
Mean	3.43	2.97	2.53
Standard deviation	(.57)	(.48)	(.53)

$p < .001$.

Note: The lower the quality mean value, the more concept characteristics and/or overall meanings given.

Summary. A repeated-measure analysis indicated that the written responses differed significantly among the three treatments. When quantity and quality were examined, the written responses of the 21 students varied according to the treatment they experienced. The mean scores were used to indicate where the differences occurred. When students participated in a student-led, small-group discussion, more words were written and more concept characteristics and/or overall meanings were cited. It is important to note that the greatest difference in both quantity and quality mean scores occurred between treatments that employed no discussions and those that held student-led discussions. The smallest mean difference occurred between teacher-led discussions and student-led discussions.

2. Will the written responses differ among high-, middle-, and low-ability students for the three strategies?

To examine ability effect over time, a factorial repeated-measure analysis was completed. The results also have characteristics of a profile analysis because there were three treatments. The univariate mixed model was used to make fuller use of the data configuration of seven students in each ability group. The multivariate test was used to examine the treatment x ability interaction. Both the ability effect and the treatment x ability interaction will be reported for the dimensions of quantity and quality.

There were statistically significant quantity differences among treatments for all three ability groups. The univariate tests of between-group effects were used to analyze the variance ($F [2,18] = 3.76$, $p < .05$). Using the means and standard deviations reported in Table 4.3, the contrast among ability groups was examined. The difference in means was greatest between Treatments 1 and 2 and smallest between Treatments 2 and 3 for the high-ability group. The difference in means was greatest between Treatments 1 and 3 and smallest between Treatments 2 and 3 for the middle-ability group. The difference in means was greatest between Treatments 1 and 3 and smallest between Treatments 1 and 2 for the low-ability group. The Wilks multivariate test for the effect of interaction between groups by treatment was not significant ($F [4,34] = 1.134$, $p = .36$).

Table 4.3.--Ability group quantity scores (N = 21).

	Treatment		
	1	2	3
High ability (n = 7)			
Mean	11.33	13.06	12.94
Standard deviation	(2.81)	(4.22)	(5.73)
Middle ability (n = 7)			
Mean	10.06	12.07	13.05
Standard deviation	(3.12)	(4.10)	(1.10)
Low ability (n = 7)			
Mean	6.21	7.33	10.75
Standard deviation	(3.05)	(3.69)	(3.37)

$p < .05$.

Note: The higher the quantity mean value, the more words were written by the students.

There were statistically significant quality differences among treatments for all three ability groups. The univariate tests of between-group effect were used to analyze the variance ($F [2,18] = 18.70$, $p < .001$). The contrast among ability groups was examined with the use of the means and standard deviations reported in Table 4.4. The difference in means was greatest between Treatments 1 and 3 for all ability groups. For the high-ability group, the smallest difference in means was between Treatments 1 and 2. The smallest difference in means for the middle- and low-ability groups was between Treatments 2 and 3. The Wilks multivariate test for the effect of interaction between groups by treatment was not significant ($F [4,34] = 1.687$, $p = .176$).

Table 4.4.--Ability group quality scores (N = 21).

	Treatment		
	1	2	3
High ability (n = 7)			
Mean	2.86	2.54	2.08
Standard deviation	(.41)	(.32)	(.47)
Middle ability (n = 7)			
Mean	3.42	2.97	2.63
Standard deviation	(.29)	(.30)	(.48)
Low ability (n = 7)			
Mean	4.02	3.38	2.90
Standard deviation	(.27)	(.41)	(.25)

$p < .001$.

Note: The lower the quality mean value, the more concept characteristics and/or overall meanings were written by the students.

Summary. A factorial repeated-measure analysis indicated that the written responses differed significantly among the three treatments for the high-, middle-, and low-ability groups. When quantity and quality of words written were examined, the written responses of the three groups varied according to the treatment they experienced. Using the mean scores, it was found that the middle and low groups wrote more words when student-led discussion took place. The high group wrote more words when teacher-led discussions took place. All three ability groups listed more concept characteristics and/or overall meanings when student-led discussions took place.

The interaction between treatment and ability was not statistically significant. The variance among treatments was not significantly higher or lower for one ability group. In some instances, however, the variance occurred in different places for different groups. For all three groups, when quality was examined, the greatest mean variance occurred between no discussion and student-led discussion. Yet the smallest variance occurred between no discussion and teacher-led discussion for the high group versus teacher-led discussion and student-led discussion for the middle and low groups. When quantity was calculated, the mean variance was different for all three ability groups. For the high group, the greatest difference was between no discussion and teacher-led discussion, and the smallest difference was between teacher-led and student-led discussion. For the middle group, the greatest difference was between no discussion and student-led discussion, and the smallest difference was between teacher-led and student-led discussion. For the low group, the greatest difference was between no discussion and student-led discussion, and the smallest difference was between no discussion and teacher-led discussion.

3. Will repeated exposure to the three strategies affect the students' written responses?

To examine whether the students' written responses changed as they became more familiar with the treatments, a repeated-measure analysis was completed using the five specific sessions of each

treatment as the variables. The dimensions of quantity and quality were calculated separately.

The quantity results were not statistically significant, thereby providing evidence that repeated exposure to the treatments did not affect the number of words written by the students. The Wilks multivariate test was calculated for Treatment 1 ($F [4,15] = .554$, $p = .70$), Treatment 2 ($F [4,16] = 1.729$, $p = .191$), and Treatment 3 ($F [4,16] = 2.354$, $p = .10$). The quantity means and standard deviations are presented in Table 4.5.

Table 4.5.--Quantity scores of treatment sessions over time (N = 21).

Treatment	Session				
	1	2	3	4	5
Treatment 1 (p = .70)					
Mean	9.18	9.44	7.99	8.84	8.83
Standard deviation	(4.30)	(4.38)	(5.69)	(4.93)	(4.53)
Treatment 2 (p = .19)					
Mean	11.70	11.60	10.32	8.92	13.30
Standard deviation	(5.69)	(5.90)	(3.81)	(4.51)	(7.93)
Treatment 3 (p = .10)					
Mean	11.93	10.13	15.12	11.18	13.03
Standard deviation	(3.34)	(4.58)	(7.59)	(4.40)	(7.83)

Note: The higher the quantity mean value, the more words were written by the students.

The quality results were not statistically significant for Treatments 1 and 2. This provides evidence that repeated exposure

to these treatments did not affect the quality of words written. Only Treatment 3 quality results were significant. This indicates that students wrote more concept characteristics and/or overall meanings as they became more familiar with Treatment 3. The Wilks multivariate test was calculated for Treatment 1 ($F [4,15] = 1.635$, $p = .22$), Treatment 2 ($F [4,16] = 1.970$, $p = .15$), and Treatment 3 ($F [4,16] = 3.106$, $p = .05$). The quality means and standard deviations are presented in Table 4.6. Note that when the quality mean scores are examined for Treatment 3, the significance that is noted above is strongly dependent on Session 4.

Table 4.6.--Quality scores of treatment sessions over time (N = 21).

Treatment	Session				
	1	2	3	4	5
Treatment 1 (p = .22)					
Mean	3.48	3.32	3.68	3.60	3.53
Standard deviation	(.73)	(.59)	(.68)	(.91)	(.60)
Treatment 2 (p = .15)					
Mean	3.13	2.93	2.83	2.75	2.98
Standard deviation	(.69)	(.65)	(.66)	(.72)	(.72)
Treatment 3 (p = .05)					
Mean	2.47	2.53	2.82	2.25	2.47
Standard deviation	(.69)	(.87)	(.74)	(.85)	(.59)

Note: The lower the quality mean value, the more concept characteristics and/or overall meanings were given.

Summary. Question 3 was important to determine whether the significance found in the treatment effect was valid. Because the same students were exposed to the three treatments, the Hawthorne

effect could invalidate the statistical results found for treatment effect. With one exception, repeated exposure did not significantly alter the quantity or quality of the written responses given. The exception was that statistical significance was found for quality scores when student-led discussions took place. More concept characteristics and/or overall meanings were cited during the later Strategy 3 sessions.

4. How do the students interact during student-led, small-group discussions about social studies concepts?

The purpose of this study was to examine differences among information-sharing lessons to determine which type of lesson could be most beneficial in helping students externalize their existing knowledge through speaking and writing. The first three questions examined the students' writing. This question concerned the students' speaking in small groups before the writing assignment took place during Treatment 3.

To explain some of the processes that occurred in the student-led discussions, a descriptive analysis was completed. This type of analysis was chosen because Question 4 concerned the interaction that took place in relation to the task the students were asked to do. If students might benefit from small-group, student-led discussions before being asked to write about a given concept, the type of interaction that takes place needs to be described. Patterns of verbal behavior, or lack of patterns, might be helpful in determining why this type of task is beneficial to students.

Three students, one from each of the three ability levels, were randomly placed together to form a discussion group. All seven groups audio-taped their discussion sessions. The tapes from three randomly chosen groups were transcribed. Three dimensions were established to help identify how the students interacted in the small group over time. In the following pages, each dimension is defined, and then excerpts from the transcripts are used to relate the dimension to the question. A summary of all the dimensions follows.

The review of literature suggested that cooperative, small-group activities might help equalize verbalization in the classroom setting (Nijhof & Kommers, 1985). The first dimension examined whether all the participants were given a chance to share information. No attempt was made to analyze what words were spoken or how many words were spoken. Equalization was determined by the opportunity the students had to verbalize when called on by another group member or when volunteering themselves.

The transcripts indicate that all students were given an opportunity to speak during every small-group session. Most often, the leader read the statement and then called on another student to respond. Then group members randomly volunteered. When there was a pause in the conversation, the leader addressed another student for more information. To illustrate this pattern over time, segments from the first and last sessions of the same group follow:

Session 1, February 10, concept: moving assembly line

Skip [Leader]: What comes to mind when you hear the words moving assembly line? [He calls on Paul.]

Paul: A line that moves to other places.

Veronica: A line that goes straight and tells you where to go.

Skip: I think it is a factory where one group of people has a paper job, a sweeping job and a cutting job. It is a moving factory.

[Pause]

Skip: Paul?

Paul: Michigan has lots of assembly lines. Northeast has lots of them. So does the Midwest.

[Pause]

Skip: Veronica?

Veronica: No, pass it back to you, Skip.

END

Session 5, June 8, concept: tundra

Paul: Am I the leader?

Skip: No, I'm the leader. What comes to mind when you hear the word tundra? [He calls on Veronica.]

Veronica: Pass. I'm thinking.

Skip: Paul?

Paul: Tundra is like on a mesa or desert--a large desert.

Skip: It is a desert, and it is really cold and has snow.

Veronica: It is a desert, and it is really hot, and it doesn't rain for seven years.

Skip: You are wrong.

Veronica: No, I'm not.

Skip: Anyone else? [The word "no" is heard on the tape.]

END

In both dialogues, the leader made sure that the other two group members were given an opportunity to speak. To illustrate this pattern across groups, the following excerpt is given from a different set of students:

Session 1, February 10, concept: moving assembly line

Leslie: What comes to mind when you think of the words moving assembly line? [She calls on Dan.]

Dan: I don't know.

Leslie: I think it means when a whole bunch of people work together to do something like glueing, putting stuff together, and all that kind of stuff.

Jay: Moving assembly line means working together to make one product and make a whole lot of them instead of one at a time.

Dan: I do know that because we did it before when we made placemats in class.

Leslie: You can get a lot of projects done.

Jay: You can do more in an hour than most people can do in 24.

[Pause]

Leslie: Dan?

Dan: No idea.

Jay: What have we just been talking about, Dan? You know, working together.

Leslie: Weren't you listening?

Dan: Yeah, I just don't have any more.

END

Note that at the beginning of the Session 5 (June 8) excerpt, Paul and Skip were not sure whose turn it was to be leader. The decision as to who was to be leader was made quickly, and the group moved along with the discussion. Several times during a session, the teacher reminded the whole class to take turns, and she found that all students got a chance to be leader during each of the five sessions. The transcripts indicate that all group members took turns at being leader, and all students spoke at least twice during each session.

The review of literature suggested that small-group discussions might allow students to integrate different points of view into one discussion. Existing knowledge is different for all students; therefore, students need to be able to express varying thoughts about the concepts presented (Webb, 1985). The second dimension examined whether different points of view about a given concept were expressed during the small-group discussions. No attempt was made to analyze whether individual viewpoints were correct or incorrect.

The transcripts indicate that students did relate different viewpoints about a given concept. The following excerpt is an example of three different meanings given for the word petroleum.

Session 2, March 15, concept: petroleum

Paul: What comes to mind when you hear the word petroleum? [He calls on Veronica.]

Veronica: I think it means you can throw energy in there.

Skip: It is a source of energy. It could be oil or a nuclear power plant.

Paul: It is oil and jelly.

Veronica: What kind of jelly?

Paul: Like Vaseline.

Veronica: Maybe it means people patrol.

Paul: You mean like people who patrol? Like on a ship or airplane? No, it doesn't mean this.

END

In the preceding excerpt, as well as many others, the students stated different ideas, but they did not often present a definition of which they were sure. Sometimes there tended to be disagreement among various predictions that were presented. At other times, it was noted that a group member would try to integrate various group predictions into a definition. The following is an illustration of such a discussion:

Session 3, April 13, concept: <u>culture</u>

Roy: What comes to mind when you hear the word <u>culture</u>? [He calls on Sally.]

Sally: I think it is when you sculpture things.

Alice: I think it is a fossil.

Roy: I agree with both of you. Maybe it is made out of play dough.

Alice: Maybe they used culture a long time ago to make their things.

Sally: Maybe it is all sizes and shapes of things in the world.

Alice: Maybe long ago the Indians used clay for culture and sculpture.

END

In the above excerpt, Roy integrated comments when he said that culture might be made of play dough. Alice's final comment integrated all of the group's comments and captured an interesting interpretation of the word culture.

Sometimes when a group was not able to relate viewpoints among group members, assistance was found from a group nearby. Here is a sample of such an occasion:

Session 2, March 15, concept: reservoir

Alice: What comes to mind when you hear the word reservoir? [The word is mispronounced, but she goes ahead and calls on Sally.]

Sally: It is like a reservation or something.

Roy: I pass.

Alice: I think it is a person who stands at a desk and gives you your reservation at a hotel.

Roy: I think it is water.

Sally: I think it is like at a restaurant and you can go to a table if you have called ahead of time. Or it could be something to do with water also.

Alice: Like in a movie and when you come late to a restaurant and this guy leads you to a table.

[Pause]

Alice: Maybe it is something to do with water. That's what the other group is talking about.

END

Several times the teacher reminded the whole class to discuss only within the small-group setting. Perhaps this is why Alice did not pursue getting further information from the other group she had

overheard. In another session this same group attempted to look up a word in the dictionary. The teacher went over to the group and asked them to put it away and just talk about the concept. There were other instances when a student would tell someone else in the group to stop listening to another group.

In reviewing this dimension, the researcher found from the transcripts that students consistently presented different points of view in the small-group discussions. Sometimes these points of view were integrated by a group member. Interaction between groups was discouraged by the teacher and the students themselves.

The review of literature suggested that higher achievers are often seen as experts in the group setting. When academic knowledge is shared, the high achievers are often seen as a valued resource by other group members (Cohen, 1984). When analyzing how the group interacted, it is important to describe the role individual group members might play in helping each other externalize their existing knowledge about a concept.

The third dimension examined whether the high achiever in each group was asked to contribute more by the other group members. This dimension also examined whether the expressed views of the high achiever were verbally repeated or restated by other group members later in the discussion. No attempt was made to consider the quality of the comments or to relate the verbalizations to the written responses produced after the discussion. The transcripts were studied to look at the high achiever's role in relation to the verbalization that took place among all group members.

The transcripts indicate that the views of the high achiever in the group were most often repeated by other group members. It is interesting that the low achiever's views often changed after the high achiever spoke. Here is a dialogue that reflects this change:

Session 2, March 15, concept: petroleum

Roy [Low]: I think it is the police.

Sally [High]: Wait, I haven't said the sentence yet. What comes to mind when you hear the word petroleum? [She calls on Alice.]

Alice [Middle]: It is like a jellyfish thing.

Sally [High]: I think it is like the stuff you can buy called petroleum jelly, and you can buy it, but I'm not sure what you can buy it for. Maybe your hair.

Alice [Middle]: Maybe it comes from that jellyfish then?

Roy [Low]: No, Sally's right about the jelly though.

END

Roy's first brainstorming comment connected the concept to the police. He ended the discussion agreeing with Sally that the concept had something to do with jelly. The middle student, Alice, did not change her idea, but she attempted to connect her comment to Sally's when she stated that petroleum jelly might come from a jellyfish, which she had mentioned earlier in the discussion.

Sometimes the low student directly asked the high student what the concept meant. This most often occurred when the low student was the leader. An example follows:

Session 2, March 15, concept: reservoir:

Danny [Low]: What comes to mind when you hear the word reservoir? [Danny mispronounces the word.] What's that, Jay?

Jay [High]: It is water, like a kind of lake or a river or a stream or sewage pipe.

Danny [Low]: How about the gutter. Probably some people drink out of it.

Jay [High]: A certain type of lake, like Crater Lake or the Potomac River.

Danny [Low]: A glass of water is like a reservoir.

Jay [High]: Leslie, do you have something to say?

Leslie [Middle]: Not really. Maybe like water in a car.

Danny [Low]: Like in a gas radiator in a car. It is plain old water.

Leslie [Middle]: Yeah, dirty water.

Jay [High]: No, it has to come from a certain place.

END

In this dialogue, Danny was the leader, and he immediately asked Jay for a meaning. As soon as he thought he understood it was something to do with water, he then believed he could add to the conversation by giving examples. He spoke after Jay gave an initial overall meaning, suggesting a glass of water was a reservoir. Then, after Leslie connected reservoir to water in a car, Danny suggested a gas radiator. Danny used both other group members' comments, but he called on the high student, Jay, to initiate a meaning.

To examine whether the high achievers were asked to contribute more by the other group members, the transcripts were reviewed for

occasions when students stated they did not have a comment to make and chose to pass their turn at that point in the discussion. A definite pattern emerged to indicate that low students passed comment the most, and high students passed comment the least. In all sessions, the high and/or middle students tried to involve the low students more in the conversation. There was also an indication that, as the low students became more familiar with the discussion procedures, they passed on their turn to comment less often. This change was not seen with the high and middle groups. To show this pattern over time and across groups, dialogues from the first and fourth sessions of two different groups are presented:

Session 1, February 10, concept: manufacturing:

Alice [Middle]: What comes to mind when you hear the word manufacturing? [She calls on Sally.]

Sally [High]: I think it is like business jobs and factory jobs.

Roy [Low]: I can't think of anything.

Alice [Middle]: I think that factory workers work in manufacturing.

Sally [High]: Like people making stuff in the factory.

Alice [Middle]: Roy, do you have anything at all to say? Would you please say something.

Roy [Low]: No.

END

During the first session, the low student, Roy, passed comment both times he was given the opportunity to speak. The fourth session is an example of how this pattern changed over time:

Session 4, May 12, concept: longitude and latitude lines:

Alice [Middle]: What comes to mind when you hear the words longitude and latitude lines? [She calls on Sally.]

Sally [High]: They separate sections on a map. There is a lot of noise outside the room. Anyway, longitude go across and latitude lines go up and down.

Roy [Low]: I learned about longitude and latitude when we talked about maps, but I don't know what they mean.

Alice [Middle]: Latitude lines go farther than longitude lines.

Sally [High]: Once we had them for spelling words. It is something that goes with length and width. Roy, do you know anything else?

Roy [Low]: Not really, except they are lines on a map.

END

During this fourth session, Roy did not pass comment. Both times he spoke, he restated part of Sally's initial comment. He also connected his comment to a previous class lesson on maps. A verbal connection to past experiences was not often given.

Another group's discussions about these same two concepts illustrate this same pattern across groups:

Session 1, February 10, concept: manufacturing:

Paul [High]: What comes to mind when you hear the word manufacturing? [He calls on Skip.]

Skip [Middle]: You publish something like toys, cars, etc., etc., etc. You know what I mean.

Paul [High]: You mean like in factories?

Skip [Middle]: Yeah, like in factories.

Veronica [Low]: I don't know.

Paul [High]: You make stuff in a factory with machines, and you put those plastic things in the back of your shirt that says manufactured by . . .

[Pause]

Paul [High]: Skip?

Skip [Middle]: I don't have anything else to say.

Paul [High]: Veronica?

Veronica [Low]: I don't have anything else to say.

Paul [High]: OK. I guess I have something else to say. Taiwan is the leader in manufacturing toys for the U.S., or the whole world I mean.

Skip [Middle]: Yeah, China, Hong Kong, and all the foreign states. Like Germany, Turkey, France. Even Antarctica! No, I don't mean Antarctica.

Paul [High]: It is in a building where you manufacture things.

END

During the first session, the low student, Veronica, passed comment both times she was given an opportunity to speak. A discussion from the fourth session illustrates the change that occurred:

Session 4, May 12, concept: <u>longitude and latitude lines</u>:

Veronica [Low]: What comes to mind when you hear the words <u>longitude and latitude lines</u>? [She calls on Paul.]

Paul [High]: Latitude and longitude were our spelling words at the beginning of the year. They are lines on the globe, and they tell what temperature and what time zone places are in.

Skip [Middle]: They are on maps and on globes. Longitude is the ones that go up and down. Latitude go around the globe.

Veronica [Low]: Latitude means the straight lines and longitude are the round lines.

Paul [High]: I still think it is the time zone and the temperature of the various regions. Veronica?

Veronica [Low]: I think it is the lines. I don't have anything else to say.

END

Veronica did not pass comment. She made a contribution of her own and then restated this initial contribution later in the discussion.

The examples from both of these groups indicate that the high students and the middle students did not pass comment as much as the low students. The low students contributed more in the later sessions.

Summary

To explain how the students interacted during student-led, small-group discussions about social studies concepts, three dimensions were established. The discussions were audio-taped. The transcripts of three randomly selected groups were examined and descriptively related to each dimension.

The first dimension examined whether all the students were given the opportunity to share information. A pattern was found that indicated all group members spoke at least twice during each session, and all group members took turns at being leader.

The second dimension examined whether different viewpoints about a given concept were expressed during the discussions. A pattern was found that indicated students consistently presented different points of view.

The third dimension examined the high achiever's role in relation to the verbalization that took place among all group members, specifically, occasions when restatements of the high achiever's viewpoints by other group members were reviewed. Whether the high achievers chose to pass their turns for comments more or less often than other group members was also subjectively evaluated by the researcher. The transcripts indicate that the information shared by the high achievers was most often restated by other group members. The high achievers were the least likely to pass on making a comment. The low students were the most likely to pass on making a comment. In the later sessions, the low achievers passed their turns to comment less often. This change was not seen with the high and middle achievers.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this study was to collect, analyze, and compare data regarding three prereading strategies designed to help students retrieve relevant information before a unit or chapter of study. The researcher examined the possible facilitating effect that these strategies had on students' speaking and writing about existing knowledge during the prereading stage. Each strategy differed with regard to the speaking done by the students before being asked to write about various social studies concepts. Each of the three strategies was alternately done five times with the same group of fourth graders over six months. The concepts chosen for the study were presented in the natural sequence of the course of study. In this chapter, major results of the study, reflections, and recommendations for further research are presented.

Major Results and Discussion

Within the limits of setting, population sampling, and methodology, the findings of this study are presented. Specific results are reported under headings of each research question explored. The level of significance for all tests was set at .05.

Total Group Difference Among the Three Strategies

Significant total group differences were found among the three strategies for both quantity and quality of words written. When students participated in a student-led, small-group discussion, more words were written and more exact definitions were cited. This finding is in agreement with Johnson et al. (1981), who did a meta-analysis of 122 cooperative-group studies conducted over a 50-year span. They found that small-group, cooperative-learning experiences tended to promote higher scores on measures relating to the group task.

The greatest total group difference in both quantity and quality mean scores occurred between treatments that held no discussion and those that held student-led discussions. The smallest mean difference occurred between teacher-led discussions and student-led discussions. Barron and Melnick (1973) did longitudinal vocabulary research in the area of biology. In support of this study's findings, they found that teacher-led, full-class discussions and student-led, small-group discussions were better than no discussions about vocabulary words. There was not as substantial a difference between teacher-led and student-led discussions, however. Barron and Melnick noted that the teacher participated like a group member when the full-class discussion took place. This type of teacher participation could account for the lack of difference between the two types of discussions. In this

study, the teacher acted as a monitor to field the volunteered responses from the students for only a three-minute period.

The quantity and quality scores both showed significant differences among the strategies. Quality scores showed greater differences. This is in conflict with Hare (1982), who found quantity of free associations was a better predictor of total recall score than was quality of free associations. In both this study and the one done by Hare, measurement of quality was based on Langer's tool. This comparison must be considered with caution, however, because Hare used postreading total recall scores on which to base results, and this researcher used prereading written responses.

Ability Group Differences Among the Three Strategies

The written responses significantly differed among the three treatments for the high-, middle-, and low-ability groups. The differences were significant for both quantity and quality. The quality and quantity variance among treatments was not significantly higher or lower for one ability group over another.

When quality was examined, all three ability groups wrote more concept characteristics and/or overall meanings when student-led, small-group discussions took place. The greatest mean variance occurred between no discussion and student-led discussion. This finding is in agreement with Bargh and Schul (1980), who suggested that when students give oral explanations of their thoughts on a given topic, they may reorganize their thinking for clearer presentation. In other words, verbalizing may help clarify existing

knowledge. Webb and Kenderski (1984) extended this idea further when they found that students from all ability levels had higher achievement scores when they gave explanations of math material during small, peer-work-group sessions. They suggested that giving explanations about material being studied may help children learn. However, Webb and Kenderson (1984) and Peterson and Janicki (1979) found a lack of significant effect on achievement between student-led, small-group settings and teacher-led, whole-group settings. The students who gave explanations in either setting scored higher in achievement. This finding suggests a link to higher math achievement might not be the grouping pattern, but the opportunity students have to speak and the ability to explain a concept or topic. This study indicated that when the factor of time was held constant for both teacher-led and student-led discussions, more students from all ability groups could verbalize their thoughts in the student-led, small-group setting.

When the quantity of words written was calculated, the middle and low groups showed the greatest mean variance between no discussion and student-led discussion. The high group, however, showed the greatest difference between no discussion and teacher-led discussion. Aronson (1976) and Cohen (1984) offered the explanation that the high students are more often eager to verbalize and more often called upon in a teacher-led discussion. Therefore, the high students might share in the teacher-led discussions and consequently write more than the middle and low students who did not share. If

the high students spoke in both the teacher-led and student-led discussions, this might account for the smaller mean difference between these two forms of discussion. Unfortunately, it could not be verified whether the high students spoke more during the teacher-led discussions. The specific students who were called on during the teacher-led discussions were not formally calculated.

Repeated Exposure to the Three Strategies

Repeated exposure to all three treatments did not significantly affect the number of words written by the students. This means that the statistical results, which indicated there was a quantity difference among treatments, held true from the first through the fifth exposure to any given treatment. This finding suggests that when each treatment was examined separately over time, students did not significantly change the number of words they wrote.

The quality results were not significant for Treatments 1 and 2. Repeated exposure to these two treatments did not affect the degree to which the students wrote concept characteristics and/or overall meanings. It is important to note that Treatment 3 quality results were significant. The statistical analysis revealed that students wrote more concept characteristics and/or overall meanings as they became more familiar with Treatment 3. This finding is in agreement with Langer's (1984) results--that repeated use of discussion and writing about concepts before studying about them might raise the quality of knowledge that readers have available to bring to the reading task. Caution must be used when considering

this change in quality for Treatment 3 over time. There was no way to sort out whether the repeated exposure to Treatments 1 and 2, along with Treatment 3, helped raise the students' quality scores for Treatment 3. In any case, these quality results indicate that students might write more concept characteristics and/or overall meanings when a long-term prereading strategy that employs speaking and writing about social studies concepts is used.

Narrative Description of the Student-Led, Small-Group Interactions

The purpose of this question was to help establish a connection between the type of group interaction and the specific group task. In this case, the cooperative, small-group task was to discuss concepts that were going to be covered in the upcoming chapter of the students' social studies text. The goal of the task was to have all group members participate by verbally sharing their thoughts and responding to the viewpoints of others. Three dimensions were established to help examine the transcripts for evidence that the goal of the task was accomplished. Each dimension will be discussed separately as it relates to the transcripts and the review of literature.

The first dimension examined whether all the participants were given a chance to share information. Transcripts indicated that all students were given the opportunity to speak during every small-group session. Each student spoke at least twice during the discussion of each concept. When Johnson et al. (1981) did a meta-analysis of cooperative learning studies conducted between 1924 and

1981, they reported that oral rehearsal of information has been found to be necessary for the storage and retrieval of information. The small-group format used in this study did, indeed, give the students the opportunity to orally rehearse information regarding the presented concepts. The transcripts are also in agreement with Sharan (1980) and Nijhof and Kommers (1985), who found cooperative tasks that require each participant to be leader are more successful insofar as they stimulate students to externalize their thoughts, arguments, and predictions. The specific thoughts, arguments, and predictions were examined more carefully through the second dimension, which will now be discussed.

The second dimension looked at whether different points of view about a given concept were expressed during the small-group discussions. The transcripts indicated that students did relate different viewpoints. Webb (1985) indicated that most studies have not used specific measures of student interaction that reflect the elaboration contained in students' interactions with one another. This researcher attempted to describe the elaboration by showing examples of the different viewpoints expressed. In addition, the sequences of interactions among students were considered. The students most often presented predictions about what the concept meant, rather than a formal explanation. Sometimes the students would disagree with one another. Only a few instances were noted in which a participant would try to integrate various group members' predictions into a definition. In agreement with Webb's results, in

this study it was found that students most often shared small bits of information. Webb suggested that one of the next steps of research and practice for small-group interaction is to explore how students can be encouraged to give each other explanations. As with much of Webb's research, this would be especially important when the task of the small group is to perform peer teaching of a concept. In this study, the task was to discuss the prior knowledge of a given concept. How students might be encouraged to listen more actively and synthesize various participants' comments might also be explored.

The third dimension examined the high achiever's role in the small group. This dimension was chosen because in other small-group studies it has been found that high achievers are often seen as a valued resource by other group members (Cohen, 1984). Cohen found that high achievers had higher rates of interaction and greater interpersonal influence than low achievers. This may be due not only to their abilities but also to their status within the group. Cohen suggested that the teacher can weaken the effects of status by manipulating the social situation. In this study, the task required that each student take a turn at being leader. An attempt was also made to allow each student to speak. These were attempts to weaken the effects of status. A prime example of a specific status characteristic is reading ability. Because the students in this study were grouped by reading ability, the high-ability students' responses were examined and compared to those of the other group members. As in Cohen's study, it was found that the high achievers'

thoughts were most often repeated by other group members. It was also found that the high achievers passed on making a comment the least. This means they stated a characteristic or an example more often than saying they did not know what the concept meant. The low achievers, on the other hand, stated they did not know what the concept meant more often than did the high or middle achievers. It was interesting to find that as the low achievers had more exposure to the small group, they stated more characteristics and/or overall meanings of the concepts presented. This was not true for the middle and high achievers. The number of characteristics and/or overall meanings remained the same for the high and middle achievers throughout the course of the study. As Bossert et al. (1984) suggested, the task characteristic of "exposure time" must be considered when group structures are decided upon in the classroom setting. The findings of this study tend to indicate that exposure time might be a factor for the low-achieving students when they remain in the same student-led small group for discussion of social studies concepts.

The implications of this study are explored in the following section.

Reflections on the Findings and Procedures

At this point, the investigator will go beyond the data to share personal reflections. In Chapter I, the purpose and design for this study were developed from needs that arose from reviewing

the related literature. In this section, the writer reviews those needs and interprets how they were addressed in this study.

The researcher assumed that one of the key purposes of doing a prereading strategy is to help students retrieve existing knowledge. Much of the research that has been done in this study area has evaluated the effect of the strategy to facilitate students' comprehension after reading a piece of text. This writer addressed the need to examine the possible facilitating effect that prereading strategies might have on students' speaking and/or writing about existing knowledge during the prereading stage. In the limitation section of Chapter I, it was indicated that how the teacher responded to the retrieved knowledge was missing from this research. The researcher merely examined the prereading stage and the quantity and quality of knowledge retrieved.

To examine student learning, the connections that a teacher might help the students make or the connections students might help one another make need to be addressed. More specifically, the question of when the teacher offers assistance is an issue to be examined. Several times during the study, the researcher (as part of the teaching team) questioned whether teacher assistance was appropriate. An example of such an occasion was when the students were discussing the concept "petroleum" in student-led small groups. Many students related "petroleum" to "jelly." The teacher was aware of the fact that the students had recently made plaster-of-paris shell fossils using petroleum jelly. During science, the students had written the words "petroleum jelly" in science notebooks as one

of the materials needed to make a fossil. While making the fossils, the students constantly asked each other to pass the large jar with the words "petroleum jelly" on it. These recent experiences came into their minds. The procedures spelled out for this study did not allow the teacher to address the students' content-specific meaning as they discussed in their small groups. The written responses might have related more concept characteristics if the teacher had been able to give the students a verbal direction to think about the term "petroleum" in a broader sense. On the other hand, it was an exciting venture for some students to research later why the word "petroleum" is used in the jelly product's name. Perhaps the students would not have done that research if the teacher had provided assistance during the prereading strategy.

The review of literature indicated many prior-knowledge studies have been done in one or two sessions, using contrived texts. This researcher attempted to address the need to examine prereading strategies in the classroom, using topics as they are naturally presented over time. To set controls for time and teacher input during strategy sessions, the teacher did not alter the students' comments in any way, and the teacher-led and student-led discussions were limited to three minutes per concept. A strength of this research was the fact that the strategies were done over time and in a natural course of study. The teacher/researcher must note, however, that the contexts of the strategy sessions were more contrived than natural lessons of this kind might be. As an

example, the limit of three minutes per concept during the discussions presented a variable that was not expected. When some concepts were presented, all the volunteers who had their hands raised during a teacher-led discussion were called upon. When other concepts were presented, there were too may volunteers for the three-minute time period. The teacher/researcher had to try to choose randomly who would get a turn. Such discussions in more natural classroom settings would certainly run for varying periods of time. The same thing occurred during the student-led discussions. Some groups had more to talk about than others. The set time did not allow for the differences that occurred when the amount of information shared by groups varied. Even though discussion times should vary, the present structure of elementary schools does set time limits on various subjects and lessons presented. When time limits are a consideration, the results of this study support the use of student-led, small-group discussions to share existing information about concepts to be studied.

The teacher/researcher felt awkward when she was not able to respond to any of the students' comments during the discussions. During the teacher-led discussions, it was difficult for the teacher/researcher not to tie students' comments together, correct misconceptions, or give reinforcement to those who spoke. As an example, one student shared her perception that the concept "frontier" meant a "tear that comes from the front of your eye." The other students began to laugh. The researcher felt uncomfortable that the logic of this student's misconception was not

dealt with at that particular time. The established guidelines for the discussion were followed, and, as a result, the setting might have been less natural for the teacher-led discussions in particular.

The review of literature suggested that when students externalize their thinking about a given topic of study, they can better relate their existing knowledge to new information that is presented. This researcher addressed the need for students to have more opportunities to speak about their existing knowledge. Cooperative student-led, small-group discussions were employed in one of the three strategies. When the written responses from all three strategies were compared, the writing done after the student-led discussions showed more words and more characteristics and/or overall meanings stated. The description of the interactions that took place in the small groups indicated that all students had an opportunity to speak.

The teacher/researcher also noted that, in addition to speaking more, all of the students were physically active in other ways during the student-led, small-group sessions. The students were eager to rearrange the room to get ready for the small groups. The students automatically got the tape recorders out and set them up for taping. After the discussion, the students put the room back in order before the writing stage of the session. The students did not leave their seats during the sessions in which no discussion or teacher-led discussion took place. In addition to speaking more,

perhaps the students were more motivated during the small-group sessions. In addition to the self-management of the small-group discussion, perhaps the students were motivated by the ownership they were able to take of the physical arrangement of the room and the operation of the tape recorders. These variables need to be considered when relating the findings to the strategies employed in this study.

The review of literature suggested that the teacher is very important in helping students understand their conceptions or misconceptions in order to better relate existing knowledge to new information that is presented. This teacher/researcher did not formally examine how the text information was later presented, or what the teacher and students did with the written responses following the various information-sharing lessons. However, both of these components were crucial to the learning that took place.

The information from the chapter was presented in various ways. Sometimes the text was read, and other times the students participated in research projects or hands-on activities related to the concepts. An example of a hands-on activity was when the students set up and operated a moving assembly line that made placemats. In many instances, the written responses were returned to the students after the information from the chapter had been studied. The students then had the opportunity to alter their original written responses. Other times, the students were given their written responses to post on a board and alter as they covered the chapter in class. The teacher often suggested or discussed the

alterations that the students made. These activities are mentioned as examples of ways new information was presented and related to existing knowledge.

The results of this study indicate that student-led, small-group discussions help students externalize their thoughts. For the learning process to be complete, teachers then need to provide lessons that help students connect those externalized thoughts to new information that is presented.

Recommendations for Future Research

1. This research should be replicated in other grade levels and in other content areas to determine the generalizability of the findings.

2. There is a need to investigate the use of the prereading strategies employed in this study with a greater number of students in a variety of classroom settings.

3. Research that employs the prereading strategies of this study should be extended to examine how the teacher later uses the written responses to help learning take place.

4. There is a need for research that compares the interactions that take place during teacher-led, large-group discussions with those that occur during student-led, small group discussions about existing knowledge of content concepts to be studied.

5. Studies that explore how students might be encouraged to synthesize group members' comments during small- or large-group discussions need to be conducted.

6. Narrative research that describes when and how teachers help students connect perceptions and correct misconceptions needs to be considered.

7. Longitudinal studies that explore the possible cumulative aspects of prereading strategies that employ cooperative grouping patterns need to be conducted.

APPENDIX

STRATEGIES, CONCEPTS, AND DATES PRESENTED

	CONCEPT	DATE	STRATEGY
1.	Plantation	January 5	1
2.	Civil War		
3.	Cash Crops		
4.	Reservation	January 31	2
5.	Pioneers		
6.	Frontier		
7.	Fertilizer	February 10	3
8.	Manufacturing		
9.	Moving Assembly Line		
10.	Equal Rights	February 15	1
11.	Atlanta, Georgia		
12.	Mississippi River		
13.	Food-Processing	February 23	2
14.	Chicago, Illinois		
15.	Meat Packing		
16.	Conservation	March 15	3
17.	Petroleum		
18.	Reservoir		
19.	Southwest	March 27	1
20.	Mission		
21.	Irrigating		
22.	Customs	April 3	2
23.	Santa Fe, Mew Mexico		
24.	Houston, Texas		
25.	Eskimo	April 13	3
26.	Technology		
27.	Culture		
28.	Ghost Town	April 24	1
29.	Basin		
30.	Continental Divide		
31.	Thomas Edison	May 1	2
32.	National Park		
33.	Dry Farming		

	CONCEPT	DATE	STRATEGY
34.	South America	May 12	3
35.	Collective Farms		
36.	Longitude/Latitude		
37.	Denver, Colorado	May 19	1
38.	Mormons		
39.	Mint Factory		
40.	Peninsula	June 1	2
41.	Los Angeles, California		
42.	Earthquake		
43.	Region	June 8	3
44.	Continent		
45.	Tundra		

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