THE EFFECT OF WORK-STUDY METHODS INSTRUCTION ON STUDENT ACHIEVEMENT IN FIFTH GRADE SOCIAL STUDIES

DISSERTATION

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF EDUCATION

By

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December, 1973

Walker, Gaston L., The Effect of Work-Study Methods Instruction on Student Achievement in Fifth Grade Social Studies. Doctor of Education (Elementary Education), December 1973, 140 pp., 26 tables, 2 illustrations, bibliography, 79 titles.

The problem with which this investigation is concerned is the effect of work-study method instruction upon the achievement of students in fifth grade social studies. The purpose of this investigation is to determine the effects of the SQ3R (Survey, Question, Read, Recite, Review) Study Method instruction upon the achievement of students in fifth grade social studies.

The subjects ranged in age from ten years two months to thirteen years three months. The I.Q. for the subjects ranged from 70 to 135. Of the 102 subjects involved in the study, 42 were male and 60 were female.

The I.Q. score from the California Test of Mental Maturity, S Form, was used to structure the subjects into three intelligence levels. Fifty-four subjects served as the experimental group, and forty-eight served as the control group.

The instrument used to obtain pretest and posttest scores on the variable relating to achievement was the SRA Assessment Survey, Blue Level. Form E was used for the pretest, and Form F was used for the posttest.

The subjects were assigned to four classes which were near equal. Two classes were selected by the principal to serve as the experimental group. The other two classes served as the control group. The investigator spent equal time with the control and the experimental group. The four classroom teachers rotated between experimental and control groups on an equal basis.

Students in the experimental group met nineteen times during the study for a thirty-minute period. During these sessions, the experimental subjects used the SQ3R Study Method to do social studies assignments. The control group met for the same number of sessions and for an equal amount of time. They worked with the same content but without using the SQ3R Study Method.

The analysis of covariance was employed with pretest scores as the covariant. An analysis of the data revealed the following findings:

1. There were no significant differences in mean gain in social studies for students receiving formal instruction in SQ3R and for students receiving no instruction in SQ3R Study Method on achievement test scores.

2. There were no significant differences in mean gain on the basis of sex for students receiving formal instruction in the SQ3R Study Method and for students receiving no in-instruction in SQ3R Study Method on achievement test scores.

3. There were no significant differences in mean gain on the basis of I.Q. for students receiving formal instruction in the SQ3R Study Method and for students receiving no instruction in the SQ3R Study Method on achievement test scores.

These findings support the following conclusions:

1. Teaching the SQ3R Study Method for a short period of time (12 weeks) for approximately thirty minutes twice weekly cannot be expected to affect student achievement in social studies.

2. Teaching the SQ3R Study Method offers no advantage on the basis of sex.

3. Teaching the SQ3R Study Method offers no advantage on the basis of I.Q.

Recommendations are based on findings and conclusions. It is suggested that

1. Better methods are needed to evaluate the study habits of elementary school children.

2. Better instruments need to be devised, validated, and their reliability established to evaluate the study methods of elementary school children.

3. Study needs of elementary school pupils need to be identified and further experimentation conducted to develop study programs to meet these needs.

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CHAPTER I

INTRODUCTION

The student is expected to have as an objective the gathering of information from various sources, one of which is state-adopted material. Although the student is generally expected to read and understand this material, educators vary in their opinions of the nature and effectiveness of techniques to be used in achieving this objective (25, p. 71). Under current school practice, the child's ability to read and comprehend content materials facilitates his academic progress.

State-adopted materials are often accompanied by lists of questions and suggested activities for the student who may be instructed to read and to comprehend the text before answering questions or completing the suggested activities.

The widespread use of state-adopted textbooks seems to be accompanied by the assumption that the child has some innate intuition which guides him in using textbooks; however, there is an apparent lack of researched instruction offering guidance in the use of such material. Also lacking is recent research showing the impact of formal instruction in effective work-study methods for the elementary school student (14).

In the interest of the student, therefore, there seems to be a need for study methods that have been investigated and shown to provide the student with procedures that will improve his comprehension as he studies content materials.

This investigation seeks verification of a study method through which children may be aided in coping with the procedures of independent study.

In 1965 Lavin reported an absence of research to determine whether or not instruction in work-study methods makes significant differences in student performance in the elementary school (14, p. 57). In fact, Lavin's research on the "Prediction of Academic Performance" reported evidence on study habits and attitudes to be "inadequate" on the high school level and "absent" on the elementary school level (14, p. 270).

Shepps and Shepps, in investigating the use of the Survey of Study Habits and Attitudes instrument with sixth grade children in reading and math, found a significant correlation between performance and good study habits (64, p. 71).

If good study habits can be developed through instruction in how to study, if good study habits can make a difference in the assimilation of content material, and if good study methods aid children in utilization of text materials, then classroom instruction in proven study methods should be given.

Statement of the Problem

The problem of this study was the effects of work-study method instruction upon the achievement of students in fifth-grade social studies.

Purposes of the Study

This study was conducted for the following purposes:

1. To measure the effect on achievement-test scores of children who study social studies material using a formal study method implementing "Survey, Question, Read, Recite, and Review Study Method" (SQ3R).

2. To compare the achievement in social studies of students receiving formal instruction in SQ3R with other children in similar classes receiving no instruction in SQ3R.

3. To determine whether students with higher I.Q. scores profit more from employing SQ3R than do students with lower I.Q. scores.

4. To determine whether girls will profit more from employing SQ3R than boys.

5. To compare the first six weeks' performance of the students using SQ3R with the last six weeks' performance for the entire study to determine whether change is continual or irregular.

Hypotheses

The following hypotheses were tested:

1. Results of the Social Studies Test of the Science Research Associates Assessment Survey, Blue Level (SRA) will show that students with formal instruction in SQ3R have significant mean gain at the .05 level of confidence over students with no planned instruction in SQ3R.

a. Results of the Social Studies Test of the SRA will show that girls with formal instruction in SQ3R have significant mean gain at the .05 level of confidence over girls with no planned instruction in SQ3R.

b. Results of the Social Studies Test of the SRA will show that boys with formal instruction in SQ3R have significant mean gain at the .05 level of confidence over girls with no planned instruction in SQ3R.

c. Results of the Social Studies Test of the SRA will show that girls with formal instruction in SQ3R have significant mean gain at the .05 level of confidence over boys with formal instruction in SQ3R.

2. Students of a given I.Q. range in the experimental group will show significantly greater mean gain at the .05 level of confidence on the SRA given at the end of the study than will students in the same I.Q. range from the control group.

a. Experimental-group students with California Short Form Test of Mental Maturity (CTMM) I.Q. scores below 90 will show significant mean gain on the SRA at the .05 level of confidence over those in the control group with the same I.Q. scores.

b. Experimental-group students with CTMM I.Q. scores 90-109 will show significant mean gain on the SRA at the .05 level of confidence over those in the control group with the same I.Q. scores.

c. Experimental-group students with CTMM I.Q. scores above 109 will show significant mean gain on the SRA at the .05 level of confidence over those in the control group with the same I.Q. scores.

3. For the Use of Sources Test of the SRA, the experimental group will show significant mean gain at the .05 level of confidence over students in the control group from the pretest to the posttest as measured by the SRA.

4. Students receiving formal instruction in the SQ3R Method of Study will show significant mean gain at the .05 level of confidence on the SRA over students having no instruction in SQ3R Method of Study as measured by the SRA.

5. Experimental-group students with higher CTMM scores will show significant mean gain on the SRA at the .05 level of confidence over students with lower CTMM scores.

a. Experimental-group students with CTMM I.Q. scores of 90-109 will show significant mean gain on the SRA at the .05 level of confidence over those with I.Q. scores below 90.

b. Experimental-group students with CTMM I.Q. scores above 109 will show significant mean gain on the SRA at the .05 level of confidence over those with I.Q. scores of 90-109.

c. Experimental-group students with CTMM I.Q. scores above 109 will show significant mean gain on the SRA at the .05 level of confidence over those with I.Q. scores below 90.

Background and Significance of the Study

A number of studies have shown that study techniques and study habits do make a difference at high school and college level (3, 4, 8, 9, 10, 15, 30). In working with undergraduate students at Oregon State University, Weigel and Weigel found the degree of knowledge of good study habits and attitudes to be highly related to academic performance (30, pp. 78-80). They found a knowledge of study methods to be a better predictor of academic achievement than ability measures. In a study conducted with Air Force personnel, it was found that study techniques, without training in the use of these techniques, are no

more effective than reading and re-reading (26, p. 49). The findings of these studies appear to indicate a need for instruction in the use of study methods.

The need for instruction in a well developed study method suggests that research be done to determine which, if any, study method has been tested and proven to be effective. For older students, a great deal of work has been done in this respect. Robinson has worked continuously since 1946 on a study method identified as SQ3R (Survey, Question, Read, Recite, Review). This study method grew out of an elaborate program at Ohio State University. It has been soundly tested, and it is reliable (2, 4, 5, 6, 7, 16, 19, 20, 21, 27, 31).

In a counseling study published in 1950, Robinson reported that freshmen students at Ohio State University who were classed as "good students" became more effective in their study after learning to use SQ3R (20, p. 238).

In a study reported in 1957, Burtt found SQ3R to be effective in improving reading rate and comprehension with high school students (5).

Research with distinct study methods for elementary school has been limited; consequently, there continues to be a lack of agreement on what study techniques to teach at this level (1, 12, 23).

In 1961 the importance and the urgency of developing a study method and the consequences for failure to do so were expressed by Heilman in the following statement:

> The intermediate grades are as important as any period in the entire educational process for the development of study skills. When a pupil fails to develop adequate study skills, the educational process may become dull and unpleasant (11, p. 288).

Even with the lack of research on study habits in the elementary school (14, p. 70), the need to teach children how to study was noted in the literature as early as 1925. In 1925 Horn published a series of readers entitled Learn to Study. The purpose of this series of elementary school readers was to aid students in learning to do problem solving, outlining, skimming, and remembering (13, pp. 6-9).

Definition of Terms

For the purpose of this study, the following definitions were formulated:

SQ3R Work-Study Method--formal step-by-step procedure to be utilized in organization and assimilation of information presented in social studies material. In this study, the steps are survey, question, read, recite, review. (See Appendix A.)

Study--effort to learn through a process of gathering, assimilating, and investigating information for the purpose of organizing and utilizing this information to enhance learning.

Achievement--academicgain as measured by the SRA.

Student Achievement--mean gain from pretest to posttest as measured by the SRA.

Basic Assumptions

These assumptions were made for this study

1. It was assumed that fifth-grade students would be desirable for this study since they have completed one full year of itermediate-level work.

2. It was also assumed that this age child would be mature enough to handle the self-directed procedure used with the experimental group. According to a child development study done by John C. Wright, this age child is capable of

> . . . discriminating levels of abstraction and generality, relevance and importance of new information, regularities and patterns in sequential events, and itermediate degrees of likelihood between certainty and indeterminacy (32, p. 372).

3. It was further assumed that the use of separate classes would reduce the effect of students communicating about SQ3R.

4. Finally, it was assumed that equal-treatment effects across groups could be maintained by the researcher's offering certain specified instruction for the control group and the experimental group.

Procedures for Collecting Data

The study was conducted with fifth grade students assigned to classes by the principal on the basis of pupil performance in fourth grade, achievement test scores, sex, chronological age, and teacher recommendations. Pupils were assigned on an individual basis, with groups kept heterogeneous. Every effort was made to have each class as equal as possible, utilizing the criteria listed.

Instructional procedures for the social studies involved four classroom teachers and the investigator serving as an instructional team. The social studies program was organized in units, with each team member accepting responsibility for particular parts of the unit. Teachers and students were informed in advance of their responsibility for these units. The division of the unit varied with the content. Each unit usually included the following areas of study: introduction, research, vocabulary, instructional media, study questions, creative project, study methods, and evaluation. These areas were set up as stations, with the pupil moving from one station to another as his work progressed.

These instructional procedures were continued during the experiment, with the researcher spending the same amount of time with the experimental and the control group.

During the first week of the study, all subjects were given the SRA, Form E, as the pretest. For the mid-test, students repeated the social studies section of the pretest.

During the final week of the study, students completed the SRA, Form F, as the posttest. The study was conducted over a twelve-week period.

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CHAPTER II

REVIEW OF LITERATURE

Students are encouraged to study, and this generally is accepted to mean that they will exert some effort to learn through utilization of source material. To study is to apply the mind in acquiring knowledge. This involves the process of gathering, assimilating, and investigating information to enhance learning and remembering. An increase in intellectual emphasis has put increased demands on students' study habits; furthermore, an objective analysis of student behavior shows that students at all levels of ability lack effective study methods (8, p. 3).

Research on learning and remembering has been used to design study methods that can benefit students (36, p. 2). However, as Berg and Rentel point out, "students do not learn study skills automatically; they need guidance and direction" (4, p. 346). Research supports the need for the teacher to help students learn how to study. As early as 1925, Horn insisted that teachers aid students in learning to do problem solving, outlining, skimming and remembering (26, pp. 6-9). In 1929 Troth described the sucessful teacher as one concerned in teaching pupils how to learn and in seeing that they acquire effective study habits (51, p. 338).

Smith expressed the need to teach students the value of interpretation and creative thinking that will allow them to be effective in their pursuit of knowledge (46, p. 71). Clements has suggested that teachers take the responsibility for teaching students the craft of inquiry (12, p. 55). In a paper presented on "Critical Reading in the Content Areas," Artley states:

> With an open mind various points of view need to be assessed, and on the basis of our most critical analysis, we need to make judgments and decisions that affect our behavior. Herein lies the responsibility of all teachers on all levels in all content areas (2, p. 122).

He enlarges on teacher responsibility with this observation:

> The development of the ability to interpret critically is a responsibility of all teachers on all levels. It involves an understanding of the factors that condition a high level of critical reading on the one hand, and on the other, a knowledge of the skills and abilities that go in to the act of critical analysis for each content area (2, p. 129).

To help students deal with the rate of knowledge increase, Shores and Snoddy recommended that ample emphasis be given to the development of study techniques that will enable the student to continue to learn independently (45, p. 651).

Are Study Methods Related to Achievement?

The controversy among educators concerning the nature of good study habits and proper attitudes probably results from the absence, until recently, of a satisfactory research instrument (44, p. 71). "Those who believe in home study

and proper study habits are apt to assign heavy work loads. Other educators are more likely to favor proper motivation toward school as the key to effective learning" (44, p. 71). In an attempt to provide a satisfactory research instrument to resolve this controversy, Shepps and Shepps used the Survey of Study Habits and Attitudes (SSHA) to examine the relationship of study habits and school attitudes of sixth graders to achievement in mathematics and reading. Research has established the validity of the SSHA for junior high school. Realizing a need for identification and elimination of faulty study habits and school attitudes at an early age, Shepps and Shepps decided to try the SSHA on sixth graders. It was their hypothesis that an instrument that predicted academic accomplishment as low as seventh grade could be expected to do so in the sixth grade. For their study, they selected ten girls and sixteen boys from the sixth grade at a private school in Jamaica Estates, New York. Study habits and school attitudes were measured by the SSHA. Arithmetic achievement was measured by the Iowa Test of Basic Skills and reading achievement by the Metropolitan Reading Achievement Test. Student scores for the two achievement tests were taken from the school records.

The results suggest that the SSHA has usefulness in the elementary school. The basic hypothesis that SSHA scores would be related to some criterion of academic

performance of sixth graders was supported in all analyses with respect to school attitudes. The study-habits subtest was not predictive for either criterion, and the total score was predictive for male students only. The results point strongly to the need of separate instruments and separate analysis of the individual parts of the SSHA. Evidently the SSHA scores of elementary school boys, at least in samples similar to the present one, predict different performances than do the SSHA scores of girls. Therefore, research should be conducted to establish validity and reliability for boys and for girls of the SSHA in the elementary school. If validity and reliability were established, then the SSHA might serve to diagnose attitudinal problems hindering effective school performance. The instrument may offer opportunities for item by item discussion in the course of counseling (44, pp. 72-73).

Shores and Snoddy observed that the teaching of research-study skills should develop the ability to approach work independently and to make correct and efficient use of a variety of informational sources. Because of the breadth of the curriculum, the teacher cannot hope to teach all information the student needs to know, nor should the teacher wish to do this. Rather, the teacher would perform greater service by guiding the student to develop skills that will enable him to learn independently. Shores and Snoddy report

that to use information from printed sources efficiently, the student needs the ability to locate and to utilize information to meet his specific purposes. Shores and Snoddy suggest five research-study skill groups for the elementary student:

1. Dictionary skills
2. Reference skills
3. Library skills
4. Map and reading skills
5. Graph and table skills.

The pupil's ability in each area should serve as a basis to the teacher for guiding, planning, and teaching efficiently. The authors suggest that these research-study skills be taught and practiced as early as a child knows the alphabet. At this early stage, he can begin to use a primary dictionary. Instruction with research-study skills should continue so long as they benefit the learner. At this time, according to the authors, there is neither theory nor research upon which to base a plan for developing a sequence for instruction in study skills. Short practice exercises of ten to fifteen minutes in length seem to be extremely effective in developing study skills (45, pp. 648-651). These authors have developed the idea that teaching in and practice with certain research skills will improve achievement in any field of study.

In a study conducted to evaluate effects of definite and detailed instruction in history on general subject

achievement, McKinnon and Burton (30) sought to determine if rules of study, knowledge of technique aids, and actual practice in use of these techniques help pupils. The investigation was made to evaluate the effects of definite, detailed instruction in certain study processes and to measure the results of this instruction on general subject achievement.

The experiment was carried out for a period of eighteen weeks with eighth grade pupils. Two equated groups were used, an experimental group and a control group. Both classes received the same instruction from the same teacher during the investigation. The sole difference was that for four forty-minute periods each week, the time for the experimental group was devoted to practice with selected study techniques. The control group spent the four forty-minute periods in undirected study.

The selected study techniques were (1) comparison, (2) identifying and expressing cause-and-effect relationships, (3) outlining, and (4) selecting and organizing subject matter. Preliminary to the experiment, both groups were given exercises, one for each of the four techniques under investigation. This was called the "Original Test" (30, p. 373). At the end of the eighteen-week period, the same material was given again to both groups with the results labeled "First Test." During the experimental period, test

exercises were given at the end of every third week. Teaching exercises using the four selected study techniques were given during the study. General achievement was tested at the beginning and at the end with the New Stanford Achievement Test, Forms V and W. Although the instruction was given in history, evidence of transfer was derived directly and indirectly throughout the study. Teachers of English and science reported definite improvement in comprehension of subject material read. A critical examination of pupils' papers in various subjects revealed that the students in the experimental group improved in sentence construction, in sequence of ideas, in selection of material, and in ability to state facts. The scores on the two forms of the New Stanford Achievement Test taken before and after the experiment show the experimental group to have gained twenty-six points in reading and twenty-four in history. There was also evidence that training in the first three study habits had a marked effect on rapid mastery of the fourth and more difficult process of selecting and organizing material.

The following conclusions were made on the basis of the data gathered in the study: (1) Definite detailed instruction in the designated techniques of study in history significantly improved the pupils' ability to use those techniques as well as their ability to use the subprocesses. (2) In the case of factors and subprocesses which are

mechanical in nature, the effect of corrective exercises appears earlier, and mastery is more complete than in the case of factors which involve thought content. (3) Instruction in three of the study techniques--sensing cause-and-effect relationships, outlining, and selecting and organizing materials--had a beneficial effect on ability to make comparisons. (4) Ability to outline varied in proportion to the number and the kinds of mechanical aids supplied by the material. (5) Mechanics of outlining can approach mastery with youth of eighth-grade level. (6) Increased ability in outlining history contributes to increased ability in outlining other subjects. (7) For eighth grade pupils, selection and organization of material on a given problem presents greater difficulty than does the objective representation of an author's thought relationships. (8) The trial-and-error method of procedure in the various types of mental activity required in study procedures wastes students' time. (9) Exercises requiring an evaluation of material offer difficulty to eighth grade pupils. (10) The number of errors in a given exercise varies directly in proportion to the length and the complexity of the exercise (30, pp. 372-379). This study indicates that instruction in study methods is superior to procedures that do not involve definite study direction. Definite study direction in one discipline seems to have a desired positive effect on pupil performance in other disciplines (30, p. 378).

Loadman conducted an experiment to determine the effect of different levels of mediational aids on paired associates' tasks when presented to sixth grade students for amount and rate of original learning and long-term retention. He employed three levels of strategies. These strategies involved learning with

1. no specific aids
2. one example given to demonstrate
3. a few examples given to demonstrate and reminders given during the assignment. Three groups of students participated in the study with each group using one of the strategies. Each group was assigned the same learning task.

The results of the experiment suggest that a great deal of structure is more beneficial than a limited amount in a paired association learning task for sixth grade subjects. This suggests that while some students can learn and retain associations by a limited structure, it is more beneficial to impose high-level structure on the task for better overall performance. Loadman found this to be true for sixth graders under the conditions of this study (29, pp. 223-225).

Stordahl and Christense (50) conducted a study with United States Air Force personnel to test whether the use of study techniques such as underlining, outlining, or summarizing while studying results in more learning than studying without such activity. The study involved an effort to determine whether the use of these study techniques

was any more effective than simply reading and re-reading prescribed material. The subjects were unselected Air Force basic trainees. The study techniques used were reading and underlining, reading and making an outline, reading and summarizing, and reading only. Each subject studied one kind of material and applied only one of the study techniques which was assigned by a random process. The subjects studied for one hour while following printed instructions. A pre-test, a posttest, and a delayed retention test were given; the findings were analyzed on the basis of I.Q. and years of education, with consistent results showing that there was no significant difference among the study techniques. Persons with higher I.Q. scores and more education received higher scores than those with lower I.Q. scores and less education. From these findings, it appears that without training in their use, study techniques for a general Air Force population will be no more effective than simply reading and re-reading of the prescribed material (50, pp. 562-568).

The authors of this study concluded that without instruction in their use, study techniques have little significance. Even though the study did not show significant difference, there was an increase of mean score from pretest to posttest for seven of the eight areas tested. Since posttest scores on seven of eight tests using study techniques without training in their use resulted in higher

mean scores, it seems legitimate to assume that instruction in the use of these techniques could produce significant difference when applied to a learning task (50, p. 569).

A study conducted at Syracuse University involved freshmen enrolled in a one-semester course meeting for 150 minutes each week to focus on improvement of reading rate and comprehension, vocabulary, and study skills. This investigation was designed to determine (1) the effectiveness of four methods of increasing rate, comprehension, and flexibility; (2) retention of gains after a period of time (eight weeks) following completion of instruction; (3) differences in gains in rate, comprehension and flexibility; (4) retention of these differences; (5) effect of increase in reading rate on the reading of textbook-like materials; and (6) whether increases in reading rate through a specific method result in an increased rate of reading both short and long passages (5, p. 350).

The four methods were referred to as (1) tachistoscope, (2) controlled reader, (3) controlled pacing, and (4) paperback scanning (5, pp. 348-349).

A total of 255 students were included in the investigation, with 179 in the experimental group and 76 in the control group. The control group consisted of five sections from the University's regular Freshmen English program. Forty to forty-five students from the experimental group were assigned

at random to one of the four treatment methods. The groups met for fifty-minute periods three times each week. Approximately thirty minutes of each class session was devoted to training by the prescribed method; then for twenty minutes, students in all sections were encouraged to apply newly acquired skills while reading paperbacks. Paperbacks used for this transfer reading represented various titles, none of which was used in the paperback scanning method. Commercial reading programs followed the recommendations made by the publishers as closely as possible. To insure similarity of presentation, lesson plans were prepared for all instructors of all methods for each session of study.

While the experimental group's sessions were involved with the four methods of instruction, the control group sections received standard instruction in Freshmen English and were told that they were part of an experiment.

Three measuring instruments were used in the study--the Van Wagener Rate of Comprehension Test, Forms D, C, and B; the Robinson-Hall Reading Test of History; and the Broam-Sheldon Flexibility of Reading Test, Forms 1, 2, 3. Each of these instruments was administered to the experimental and control groups at the beginning and end of the seventeen-week instructional period and again eight weeks later.

Analysis of the data at the end of the instructional period revealed the following:

1. Significant gains in reading rate were made as a result of all methods of instruction.

2. No significant changes in comprehension level were detected on the Robinson-Hall Reading Test of History or the Broam-Sheldon Flexibility of Reading Test as a result of any of the methods.

3. Significant gains in flexibility, as measured by the Broam-Sheldon Flexibility of Reading Test, resulted from all methods except the tachistoscopic method.

4. Comparison of gains in reading rate resulting from the four methods of instruction revealed that there was a significant difference at the .01 level of confidence favoring the paperback scanning method.

5. Comparison of gains in reading flexibility resulting from the four methods of instruction revealed that no method produced significantly superior results in reading flexibility at the .01 level of confidence. However, a rank-order was observed, with the paperback scanning method producing the greatest gains, followed by the controlled reader, controlled pacing, and tachistoscope.

6. The paperback scanning method proved to be significantly superior to all other methods in producing increased reading rate on both long and short passages (5, p. 350).

Analysis of data accumulated eight weeks after the instructional period revealed

1. Gains in reading rate were retained by all the experimental group sections with no significant difference between sections.

2. No significant loss appeared in gains in reading flexibility resulting from each of the four different methods of instruction.

3. Since there was no significant change in comprehension level between pre- and post-instructional testing, there obviously were no gains in comprehension to be retained after the eight-week period (5, p. 350).

The findings of this study show that reading rate can be increased without loss of comprehension. From the findings, it was concluded that increased reading rate has a direct correlation with gain in flexibility. The paperback scanning method for increasing reading rate and flexibility proved to be consistently superior to the three other instructional methods. The findings of this study suggest that any emphasis on the use of machines to increase reading rate, comprehension, and flexibility should be re-evaluated since there appear to be other, more effective, less complicated and less expensive approaches to the desired end. This study reports that instruction in study methods affects reading rate, comprehension, and flexibility (5, pp. 351-352).

The trend to offer some type of study-method instruction has grown steadily since World War II. In 1953 it was found that over 90 per cent of colleges in the United States offered some kind of study-skills course, at least to selected groups of students, and 10 per cent required such a course of all freshmen (17, p. 243).

In 1960 Entwisle (17) did a detailed review to examine reports of evaluation of study-skills courses to see how effective the courses actually were. She reviewed a total of twenty-two evaluations which included detailed data found in the literature. Nineteen of the programs were being used with college students, one with ninth grade, one with high

school low achievers, and one with grades eleven through fourteen. Twelve of the programs reported an immediate significant increase in pupil performance, and six reported an improvement without reporting significant statistical evidence. Only one study reported a decrease in performance for a study-method program. Three programs reported some gain, but statistical reports of their program showed these gains to lack significance. Of those reporting significant gain, five reported follow-up evidence that the improvement had been maintained. The time for these follow-up reports ranged from the next semester to fourteen months.

In summarizing her evaluations of study-skills courses, Entwisle stated that the difficulty of evaluating these programs results from a lack of study habit inventories and from too much evaluation based on "expert opinion" rather than on results of empirical findings. Accepting the limitations on ability to evaluate, Entwisle made the following report on the study-skills courses reviewed: (1) study-skills courses are usually followed by academic improvement, and (2) any gains noted were not necessarily related to course content. The content of the courses reviewed varied from active teaching of study mechanics through supervised practice in studying specific course material and general materials to individual counseling. Academic success was the typical criterion of effectiveness (17, pp. 243-247).

In a later study based on findings reported by Entwisle, Weigel and Weigel (57) conducted a study to examine the tacit assumption underlying didactice study-skills courses; that is, many students do not know effective study skills and attitudes, and these must be taught. The subjects were 106 male and 139 female under-graduate students enrolled in psychology courses at Oregon State University. A Real-Ideal measure was employed to examine the usage and knowledge of study skills and attitudes. Real scores reflect the usage of study skills and attitudes, and Ideal scores reflect the knowledge of them. The study attempted to answer these questions.

1) Do students report more knowledge of study skills and attitudes (Ideal) than they put into practice (Real)? Does reported knowledge and usage vary by academic class in college?
2) What is the relation of usage (Real) to academic success?
3) What is the relation of knowledge (Ideal) to academic success?
4) What is the relation of the agreement of usage (Real) and knowledge (Ideal) to academic success?
5) What is the relation of usage (Real), knowledge (Ideal), and the agreement between them to an ability measure? Does the agreement of usage and knowledge add to an ability measure in the prediction of academic success? (57, p. 78).

The Brown-Holtzman Survey of Study Habits and Attitudes (SSHA) was administered to each subject under two sets of instructions. Under Real instructions, he was to rate himself as he actually feels and acts. These reported habits and attitudes were assumed to be those the subject actually uses. Under Ideal instructions, he was directed to respond as he feels the ideal student would respond.

Mean Ideal scores were found to be greater than mean Real scores for both males and females. One finding of the study was that college students do have a good knowledge of study habits and attitudes but do not put them to maximum use. The authors reported finding that usage of study skills and attitudes is moderately correlated with academic performance. With freshmen males, the degree of knowledge of good study habits and attitudes was found to be highly related to academic performance. This high relationship was not found with female subjects. For male and female students, this knowledge predicted academic achievement better than ability measures.

Weigel and Weigel concluded from this study that college students in general know how to study but do not necessarily employ this knowledge. For those students who do have poor knowledge of effective study habits and attitudes, one might concentrate on the teaching of skills. For students with high knowledge of skills and attitudes but low reported usage, concentration on motivational remediation or practice in the use of study skills would be more appropriate (57, pp. 78-80).

In a research study conducted to test a functional approach to textbook study for college students who are pressed for time, Kollaritsch developed an effective note-taking method that aided the student in his effort to

organize and learn from reading in a short period of time. The method involved dividing the reading into small sections, recording section heading, picking out main points for each paragraph, and stating them in the student's own words. This method was found to be simple enough for use by a remedial student, especially effective for those slow-to-average students who have difficulty determining main ideas, and yet efficient for an upper-level student. The method had these effects on the learner: (1) It forced him to concentrate while studying; (2) He received practice in picking out main ideas and stating them in his own words; (3) It compelled him to put main ideas in order and learn the related detail; (4) The student reviewed as he read; (5) The student's review time was reduced significantly. The purpose of this type of note-taking is not to make the student independent of his textbook. Instead, the student makes an efficient, shorter outline to be used along with his textbook (27, pp. 29-31).

In an effort to investigate the relationship between specialized instruction in study skills, developmental reading, counseling and academic progress, a study was conducted by Sawyer and Martin (43) using three equal groups. All three groups were matched on their obtained School and College Ability Test scores, English and mathematics placement test scores, college majors and semester hours

attempted. All students in these groups were above average in quantitative skills and below average in verbal skills. The experimental group was composed of pre-registered students enrolled in an intensified instructional program in study skills and developmental reading, and they were provided specialized conseling services. The control group was accorded no variation in traditional method of enrollment or instruction.

The purpose of the investigation was threefold:

1. To ascertain the effect of a specialized program of study skills, developmental reading, and psychological counseling on the obtained GPA of the experimental group

2. To ascertain the degree of success associated with a developmental reading program when employed with an experimental group manifesting limited verbal skills

3. To ascertain the effect of a specialized program of study skills, developmental reading and psychological counseling on the attrition rate of the experimental group (43, pp. 52-53).

Ninety subjects were selected for participation. Students in the experimental group were informed by letter of the objectives of the project. The class meetings were scheduled for two hours (T and Th), and the participants received no academic credit. A course outline was provided and followed closely. Counseling appointments were scheduled as the participants or the instructor felt counseling was needed. Data were obtained on pretest and posttest forms of a diagnostic reading examination. Robinson's Effective

Study was used as a textbook and provided the basic frame of reference for the intensified instruction in study skills and study habits.

When the grade-point averages obtained by the three groups were submitted to an analysis, a significant difference was discerned for the initial semester of the study, but there was no significant difference for the final two semesters. Further analysis of the first semester grade-point averages indicated a difference between the experimental and control groups. The reading phase of the project was highly successful in terms of increased reading rate with no significant decrease in the level of comprehension.

Sawyer and Martin stated,

> It seems reasonable to conclude that the experimental project was successful, both in terms of grade-point averages and reduced attrition rate. Further, it would appear that a developmental reading program can assist students with limited verbal abilities to progress toward more effective and efficient reading skills (43, p. 55).

This experiment afforded the experimental group an opportunity to secure those skills that correlate with success in school. They were counseled in using study skills while they learned them. The result was increased grade-point averages for the students and reduced attrition rate for the college.

An investigation was undertaken by Haslam and Brown (22) to determine the effectiveness and acceptability of

study-skills instruction for high school sophomores. The research project was designed to determine if the Brown-Holtzman Effective Study Course: High School Level could produce significant improvement in the scholastic motivation, study behavior, and academic achievement of high school sophomores.

In selecting experimental students, preference was given to students who indicated a desire to continue their education beyond high school. The experimental group was selected from students requesting enrollment in an effective study course. One section was offered during school and one after school. All subjects were sophomores. The control group came from sophomore English classes and were matched with the experimental group on an individual basis on sex, race, age, intelligence quotients, first nine weeks' grade averages, and subjects currently taken. The control group was denied instruction in how to study. Matching of the experimental group with a control group was done so that the two groups could be compared on two subsequent indices of instructional effectiveness--third nine weeks' course grades and scores on the Effective Study Test.

At the conclusion of instruction, each experimental student's reaction to instructor effectiveness, course content, and program acceptability was determined by administering a course evaluation questionnaire. The Survey

of Study Habits and Attitudes was also administered to the experimental group both before and after instruction, and the resulting scores were compared. The Effective Study Test was administered to the experimental and control groups, and test scores for the two groups were compared in order to determine their relative levels of study-skills knowledge. Course grades for the experimental and control subjects were analyzed to determine the influence of the unit on study skills and its influence on subsequent scholastic success.

For each of the seven SSHA scales, the experimental group showed significant improvement from pretest to posttest. The Effective Study Test results gave positive significant evidence that the experimental group was significantly more knowledgeable about efficient study techniques. In comparing grade point averages, the experimental grade point average increased .26 and at a level of significance greater than .001. During the same time period, the control group's increase was .06 and at a significance level less than .10. The experimental students' reactions were decisively positive to all evaluated aspects of the how-to-study course.

The statistical analysis of data indicates a level of significance acceptable to most authorities. One may conclude from the research data that the study-skills instruction given to the sample of high school sophomores did increase their knowledge of effective study procedures,

improve their overall study orientation, and improve their subsequent academic achievement (22, p. 226).

In her review of study-skills courses, Entwisle pointed out that the issue of what specific techniques should be included in a study-skills course is unsettled (17, p. 243).

Brink analyzed the study techniques of more than 1,000 high school students and found that the best students use the techniques below.

1) Summarize the main points in their own words instead of copying sentences and paragraphs directly from books.

2) Read all instructions before seeking answers instead of reading one instruction, writing the answer, then the next, and so on, until the assignment is finished.

3) In making reports, use such study aids as the card catalog and the readers' guide. Inefficient students proceed aimlessly, browsing through books and magazines for their material.

4) In making outlines, read an entire section to comprehend general ideas, then decide on major and minor topics.

5) Attempt to discover the meaning of an unknown word by its use before they look it up in the dictionary. In using a dictionary, they skim rapidly to find the appropriate meaning.

6) Adapt reading to the purposes involved. If they have to read many pages to find specific facts, they skim through rapidly to locate pertinent material, then read carefully.

7) Rely strongly on their own judgments and opinions in study situations (7, p. 40).

Study For Elementary School Students

In 1965 Lavin reported an absence of evidence of research on study habits and attitudes on the elementary school level (28, p. 270).

In 1925 Horn published a series of readers entitled Learn to Study. He stated that the purpose of these readers was to aid students in learning to do problem solving, outlining, skimming, and remembering (26, pp. 6-9).

In 1929 Troth emphasized the need to teach effective study habits when he described the successful teacher as one concerned in teaching pupils how to learn and in seeing that pupils acquire effective study habits (51, p. 338).

Heilman stressed the importance and the urgency of developing study methods and the consequence for failure to do so in the following statement:

> The intermediate grades are as important as any period in the entire educational process for the development of study skills. When a pupil fails to develop adequate study skills, the educational process may become dull and unpleasant (23, p. 288).

Stiles expressed the need for guidance in study methods when he said, "students do not learn study methods automatically; they need guidance and direction" (2, p. 128). Stiles further indicated that this guidance in study methods should begin when reading instruction begins.

Since 1965 additional studies have been reported using study-methods instruction with elementary school children.

The research done by Loadman which appears earlier in this chapter indicates that a great deal of structure seems to be more beneficial than a limited amount in paired-associates learning tasks for sixth grade subjects (29, p. 229).

In research done by Shepps and Shepps, also described earlier in this paper, an investigation of the relationship of sixth grade study habits and school attitudes to achievement in mathematics and reading was undertaken. The Survey of Study Habits and Attitudes (SSHA) was used to examine this relationship. The results of this study point toward the necessity of separate analysis of the results in the elementary grades for male and female scores and separate analyses of the individual parts of the SSHA. If the difference in meaning of the SSHA scores of boys and girls is recognized, research using different criteria of academic performance should make possible the use of SSHA in elementary school for early diagnosis of individual problems hindering effective school performance (44, pp. 71-73).

In offering a solution to the task of teaching with knowledge increasing at a rapid rate, Shores and Snoddy offered two feasible alternatives to deal with such a monumental undertaking. First, the educator must select the most telling aspect of the most vital subject as content to be taught. Second, ample emphasis must be given to the development of those skills that will enable the student to

continue to learn independently. In order to guide, plan, and teach efficiently, the teacher needs to know the abilities of his pupils in the use of study habits (45, pp. 648-651).

Berg and Rentel (4) reviewed the literature related to (1) skill in locating information, (2) ability to select and evaluate information, (3) ability to adjust the method and rate of reading to the purpose and the nature of the material, (4) facility in using information, and (5) skill in retaining what is read. Study manuals were not analyzed, but journal materials published over the last ten years were studied. They found, in many instances, that these were preachments based on opinion rather than on research. In their survey, they found a lack of agreement concerning what study techniques to teach. They did find agreement, however, that instruction and practice in study skills did produce significantly higher skill levels than were obtained through trial and error (4, pp. 343-348).

Skimming was supported as a skill that enabled fourth grade pupils to define the author's purpose; it provided them with an active mental set for attention and comprehension; it structured for these readers the author's organization; and it helped them to set the rate at which they read. It was observed that guidance in skimming should begin when a child is learning to read. Questions available during

reading, especially if they are placed at the beginning of a selection or immediately before the related information, are most effective in enhancing delayed and immediate recall. This method surpasses both careful reading without questions and re-reading the same material.

Other self-directed or independent study techniques, as opposed to the lecture format, revealed that students do not learn study skills automatically; they need guidance and direction. Students also need a selection of study skills from which to choose, to assist with any conceivable study problem.

Concerned students who enroll in study-skills courses raise their grade points, while students who are similarly concerned but not enrolled do not make the same gains (4, pp. 343-346). Achievement, as measured by grade point average, is correlated with study-skills instruction.

As a result of this review, the authors recommended that children receive instruction in study skills at an early age, and that this instruction be self-directed with proper guidance (4, pp. 343-346).

In writing about middle childhood, Wright reports that by age eleven, children learn to discriminate levels of abstraction and generality, relevance and importance of new information, regularities and patterns in sequential events, and intermediate degrees of likelihood between

certainty and uncertainty. Between the ages of six and eleven, the child's capacity for thought and reasoning shows its most significant growth. To an undetermined degree, this growth is stimulated by the beginning of formal scholastic instruction and the acquisition of reading and writing skills. Pedagogists and psychologists generally agree that the maturation of intellectual capacities at about age six provides a readiness for formal learning and instruction (60, pp. 372-373).

These statements propound the theory that a child is ready to learn study methods at the age when he would be expected to begin formal education. There is evidence that elementary school children will need guidance and direction in learning proper study methods rather than being left to develop study habits on their own. The development of good study methods seems to have a positive effect on achievement.

SQ3R Study Method

Stiles, reading consultant for Gouremeur High School in New York, reported results of an in-service training program for the SQ3R Study Method. Participants in the program--teachers from both junior and senior high schools--met for five hours of instruction. The five lessons were designed to show teachers how the SQ3R Method could be used both for supervised study within the classroom and for

individual study. The classes were taught by a consultant using SQ3R in five different subject areas. During each of the five sessions, the teachers were given mimeographed helps and additional suggestions. The results of these meetings have not been formally analyzed, but a number of observations have been reported.

In the junior high school, all English teachers and many teachers in other subject areas in grades seven and eight taught their pupils to use the SQ3R Study Method and were enthusiastic about results. Pupil interest in class work and outside assignments was improved. More supervised study was done in classes. Teachers improved their lesson plans and asked the consultant for help and materials. More library books were read by the pupils and teachers. The librarian reported that more encyclopedias and other reference materials were in demand. Discipline problems decreased noticeably, and the general atmosphere in the building became more industrious.

Teachers in the senior high school were slower to catch on, and results were harder to detect. This report gives strong evidence that teacher enthusiasm is necessary for any method or program to succeed (49, pp. 126-131).

In a summary reported by Entwisle, Robinson used the SQ3R Study Method with college students. He reported definite improvement in skill tests, grades, social adjustment, and behavior rating (17, p. 244).

In the "Specialized Study Skills Developmental Reading Instruction and Counseling" research done at the University of Missouri-Rolla by Sawyer and Martin, Robinson's SQ3R Effective Study Text was used as the basic framework of reference for intensified instruction in study skills and study habits. After three semesters with this experiment, subjects showed significant improvement in reading rate and efficiency in words per minute and a slight increase, although not significant, in comprehension (43, pp. 53-55).

The SQ3R Study Method was designed primarily for history, social science, and similar prose material. The use of this method has been more successful when actual practice under supervision was employed in training students in its use. This activity should be closely allied to a student's lessons in his other courses. For this training to be of value, the student must realize its importance and, of his own volition, do the work (4, p. 345).

Chapter Summary

The literature reports a number of studies on teaching study methods. Almost without exception, these report a correlation between ability in study methods courses and academic achievement. In reading these research reports, one is obliged to watch for success reports based on statistical evidence as opposed to success based on researcher enthusiasm.

Most of the research done with study methods has been done in college with a small number being done in junior and senior high school. Very few scholarly investigations have been conducted with a specific study-method approach in the elementary grades. When studies have been reported for levels below college, even in the elementary grades, the findings have shown improvement; and in some cases, significant progress has been reported.

There appears to be more written about study methods and the need for them than about successful programs in which they are being utilized. For elementary schools, it is suggested that teaching of study habits should begin with learning to read and should be given careful guidance and direction.

Research studies appear to be in agreement on the need for guiding students as they develop study habits. There is confusion and disagreement in the literature on which study methods are more desirable.

The method which appears more in the literature and is more widely used for elementary school, secondary school, and college is the SQ3R Study Method.

The studies reported here were designed to assist the student in his effort to learn through a process of gathering, assimilating, and investigating information for the purpose of organizing and utilizing source material. Implications from the research reported here indicate that

students do profit from study-method instruction. Questions related to the value of teaching students how to study are yet to be investigated. Such questions are

(1) Will a knowledge and understanding of study methods aid the learner?

(2) Does knowledge about the specific techniques make a difference?

(3) When practice in study methods is conducted on a formal basis, will it improve the pupils' use of these procedures in independent work?

(4) Do the pupils master these techniques better through discovering them or by being aided to see and use them?

(5) Is there enough evidence reported in the literature to support a significant correlation between taught study methods and student achievement?

(6) What is the optimal age for introducing instruction in study methods?

These questions are alluded to in the literature, but a scholarly search for answers makes it imperative that the reader possess the ability to differentiate between recommendations based on research findings and those based on researcher enthusiasm.

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CHAPTER III

METHODS AND PROCEDURES

This chapter describes subjects, school setting, procedures for collecting data, instruments used to gather data, procedure for statistical analysis of data, and procedure for experimental and control group sessions.

Subjects

Subjects for the study were all the fifth grade pupils in one elementary school. Both girls and boys were included in the sample of 108 students; 46 were male and 62 were female. Initially, there were 23 males in the control group and 23 males in the experimental group with 31 females in each group.

Six subjects from the control group failed to complete the study. One male student failed to complete the pretest, two withdrew after taking the pretest, and one was absent when the posttest was administered. One female withdrew from school before taking the posttest, and one was absent the day the posttest was administered.

Following the posttest, there were 23 boys and 31 girls in the experimental group, and 19 boys and 29 girls in the control group for a total of 102 subjects. Each student who completed the pretest and the posttest was included in the study.

Chronological Age

Students, on the day of the pretest, ranged in chronological age from ten years two months to thirteen years three months. Their mean age at that time was eleven years one month.

Males completing the study ranged in chronological age from ten years five months to thirteen years three months. Their mean age was eleven years two months.

In the control group, the mean chronological age was eleven years one half month with a range of ten years two months to twelve years four months. The range for males in the control group was ten years six months to eleven years eight months. Mean chronological age for male students in the control group was eleven years one month; for girls the mean chronological age was eleven years and zero months. The range for female subjects in the control group was ten years two months to twelve years four months.

Chronological age for the experimental subjects ranged from ten years three months to thirteen years three months. The mean age for the experimental group was eleven years two months. Boys' mean chronological age was eleven years three months; for girls the mean chronological age was eleven years one month. Male range for this group was ten years five months to thirteen years three months. Chronological age range for the girls in the experimental group was ten years three months to twelve years one month.

The chronological age range for females on the day of the pretest was ten years two months to twelve years four months. The mean chronological age for the females completing the study was eleven years and one half month at the time of the pretest.

Intelligence Quotient

The I.Q. for these subjects was obtained from the California Short Form Test of Mental Maturity, Level 2--1963 S-Form (CTMM). The I.Q. range for the sample was from 70 to 135. The median I.Q. for all subjects was 108, and the mean I.Q. was 106.

The I.Q. range for girls in the study was from 70 to 130, with a mean I.Q. of 106. Male subjects had an I.Q. range of 73 to 135, with a mean I.Q. of 104.

For the experimental group, the I.Q. range was from 73 to 130, with a mean I.Q. of 104.

Female subjects in the experimental group had an I.Q. range of 74 to 121, with a mean I.Q. of 105. Male students in this group had a mean I.Q. of 101, with a range from 73 to 130.

The control group had an I.Q. range of 70 to 135. Their mean I.Q. was 108.

Male subjects in the control group had a mean I.Q. of 108 and a range of 86 to 135. Girls in the control group had an I.Q. range of 70 to 125, with a mean I.Q. of 108.

Achievement Test Scores

Pretest and posttest scores were obtained from the SRA Assessment Survey, Forms E and F, Blue Level. Form E was given for the pretest and Form F for the posttest. One hundred two subjects completed forth the pretest and the posttest with 48 of these from the control group and 54 from the experimental group. Forty-two subjects were male and 60 were female. Twenty-three males were in the experimental group, and 19 were in the control group. Thirty-one female students were in the experimental group, and 29 were in the control group.

The composite score for the pretest included total reading, language, and mathematics. The composite raw score for the control group on the pretest was 69.5 of a possible 99. For the experimental group, the composite raw score for the pretest was 66.5.

Pretest reading scores were 63.5 of 90 possible for the control group and 58 of a possible 90 for the experimental group.

Language arts pretest scores were 73.5 of a possible 110 for the control group. For the experimental group, the raw score was 71 of the possible 110.

In mathematics, the experimental group had a total raw score of 55.5; the control group scored 54 of a possible 80.

The control group had a pretest social studies raw score of 36; the experimental group had a pretest raw score in social studies of 35.5 of a possible 56.

In science, the pretest raw score for the control group was 36; and for the experimental group, it was 33 of a possible 56.

For the Use of Sources test of SRA, the control group had a pretest raw score of 37; the experimental group had a pretest raw score of 35 of a possible 53.

Posttest scores and the statistical treatment of pretest and posttest scores will be covered in Chapter IV.

Professional Staff

The Superintendent of Schools

Permission to conduct the experiment was received from the superintendent. He assisted in the selection of a school.

The Elementary School Principal

Permission was received from the principal to conduct the study and to meet with the classroom teachers involved.

The Classroom Teachers

All teachers were female with teaching experience before the year of study. Each was given a copy of Appendix A, and the SQ3R Study Method was discussed in some detail. Each teacher was eager to be a part of the study and to

include the investigator as the fifth member of the teaching team. They felt that it would be necessary for the fifth team member to be present at Monday afternoon planning sessions. They were concerned that he keep abreast of what the students were doing the rest of the school day. They felt it important to know in advance about details of the experimental and control sessions.

School Setting

The school in which the study was conducted was in a suburban residential district which serves predominantly white, middle class, salaried people. There were no blacks or Latin-American-surnamed pupils in the sample.

For administrative purposes, the students were assigned by the school principal to four homerooms, with a classroom teacher responsible for each homeroom. This assignment had no relation to this study. The physical arrangement of the classrooms is shown in Figure 1, page 58.

All group meetings for the experimental and control groups were held in the large open area designated as classrooms C and D. The instructional program was conducted, with the teaching staff working as an instructional team. One of the regular classroom teachers served as team leader for the school year and chaired the planning sessions. Through group planning, each teacher was assigned her

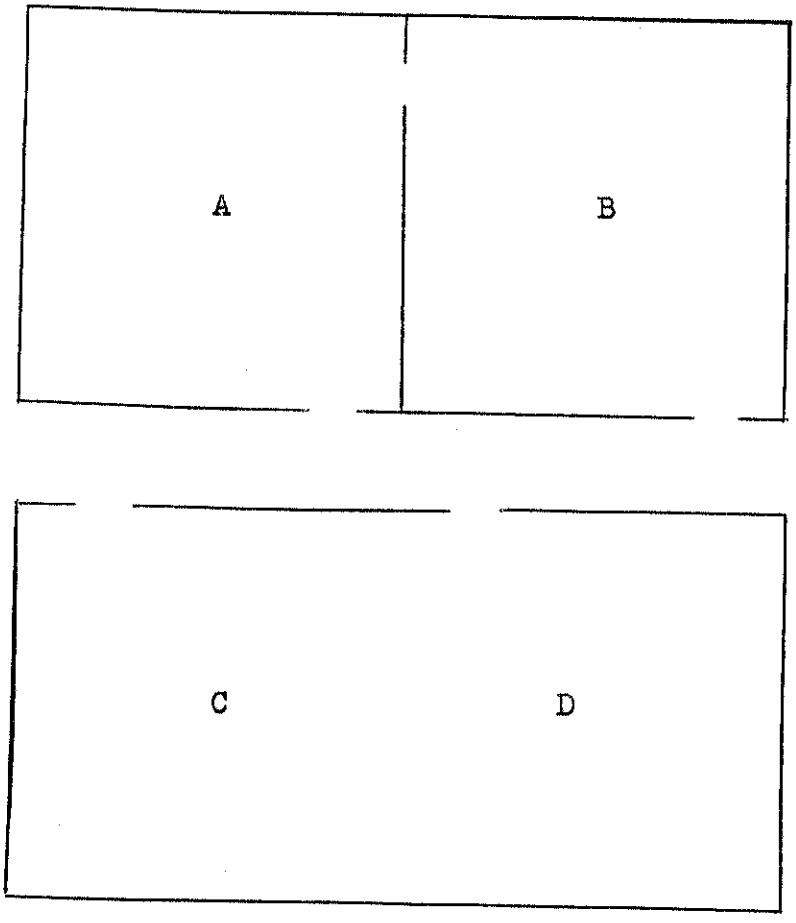

Fig. 1--Classroom arrangement

responsibility for a part of the instructional program. Students moved from station to station, with an assigned teacher at each station to assist them. Classes conducted by the investigator used rooms C and D in Figure 1 as a teaching station.

Instruments

Two instruments were utilized in this study. Each subject in the study completed the California Short Form

Test of Mental Maturity, Level 2, 1963 Revision, S-Form (CTMM). The result of this test served as a control variable. The Science Research Associates Assessment Survey, Blue Level, (SRA), Form E, 1971, was the control variable, and the SRA Form F was used for the criterion variable.

The CTMM measures logical reasoning, numerical reasoning, verbal concepts, memory, language, and non-language (1, p. 443). The CTMM was used to structure the subjects into three intelligence levels within the experimental group and three corresponding levels within the control group. Norms for the CTMM were taken from classes in 253 schools representing 7 geographic regions and 49 states. The total score reliabilities range from .93 to .96, those for the language section in the low .90's and for non-language in the high .80's (2, p. 635). Validity shows the CTMM to be correlated with the Stanford-Binet from .66 and .74 for language and non-language (2, p. 636).

As a simple omnibus test of mental ability, the CTMM is regarded as quite comparable and on par with other group intelligence instruments (2, p. 636).

The Science Research Associates Assessment Survey (SRA), Blue Level, 1971, Form E and F was used to measure the student's achievement in the areas of reading, vocabulary, mathematics, language arts, spelling, social studies, use of sources, and science. This is a 1971 revision. The

midtest was taken from the social studies portion of the pretest. Specifications for the test content were devised from curriculum outlines across the nation and from scope-and-sequence charts of major basal texts from the following publishers:

1. Follett
2. MacMillan
3. Ginn
4. Science Research Associates
5. Silver Burdett
6. Allyn and Bacon, Inc.
7. Harcourt-Brace and Jovanovich

Test questions were written by selected teachers and writers. The questions were edited and pretested against a national sample. The tests were standardized on the sample representative of the national student population. To obtain a representative sample, SRA used random selection rather than prescriptive selection to minimize bias, thus enabling the norms to be more representative (4).

Buros reports the test as having content validity in that it reflects what is taught as well as most achievement batteries and better than some (2, p. 39). Part scores are not as reliable as composite scores, but most subtest scores appear to have adequate, if not high, reliability for use with individuals as well as groups.

Distribution of students for the 1971 standardization sample for the fifth grade test was 7,262 third graders, 11,399 fourth graders and 9,623 fifth graders, for a total of 28,284 subjects.

A correlation coefficient for reliability of the test is given in Table I.

TABLE I

FIFTH GRADE RELIABILITY COEFFICIENT OF THE SRA ASSESSMENT SURVEY, BLUE LEVEL

	Fifth Grade
Composite	.99
Reading	
Comprehension	.91
Vocabulary	.93
Total	.96
Language	
Usage	.94
Spelling	.89
Total	.95
Mathematics	
Concepts	.88
Computation	.91
Total	.94
Social Studies	.91
Science	.93
Use of Sources	.91

The method for estimating reliability for this test was the use of the KR-20 formula. Representative KR-20 reliability estimations are presented in Table II, Chapter IV, page 70 (4, p. 6-7).

Procedures for Collection of Data

The basic purpose of the study was to compare the effect of work-study methods instruction on student achievement, using a formal study method (SQ3R). The students were assigned to four classes which were assumed to be near equal. From these four classes, the principal arbitrarily selected two as the control group and two as the experimental group. Each group was further divided into high (above 109), middle (90-109), and low (below 90) I.Q. groups.

The CTMM scores were obtained from the student's permanent record. Those having no results from this test were tested by the elementary school counselor who was the regular counselor for this school and who was responsible for administering all standardized tests.

The SRA, Form E was used to obtain pretest scores on the variable relating to achievement. Before the SRA was administered, the students were informed that they would be taking additional tests to determine if the new tests were as good as those used previously. The SRA, Form E, served as the pretest and SRA, Form F, served as the posttest. These were administered by the school counselor and proctored by the four classroom teachers who participated in the study.

The interval test, administered by each teacher on a homeroom basis, was the social studies portion of the pretest.

Prior to the initiation of the study, a meeting was held with the four classroom teachers assigned to the

subjects of this study. Procedures were outlined that allowed the researcher to become a fifth member of the social studies teaching team. He was given a team assignment that enabled him to spend equal time with the four classes. The teaching role assumed by him was that of helping, teaching, or observing in the control group and giving instruction in the use of the SQ3R to the experimental group. The nature of the experimental group meetings were outlined and discussed during this session.

Procedure for the Experimental Group

During the sessions in which the experimentor was teaching, classroom teachers were observing as students practiced using SQ3R in social studies. The teachers did not offer direct instruction in the experimental procedure, but it was important that they be controlled as a variable. This was done by having each of the four teachers rotate on an equal time basis for the experimental sessions. It was important to the study for each teacher to understand the purpose of the study and her role within the framework of the project. In order that the responsibilities be understood, the following procedures were outlined:

1. The initial meeting of the experimental group was to clarify the objectives of the group and to encourage involvement of the students. For the students, this initial meeting clarified the purpose of the experiment and allowed them to become acquainted with the researcher.

2. Teachers observed, accepting a passive role in the conduct of this session.

3. As nearly as possible, the group sessions were limited to thirty minutes.

4. The group meetings were held in the same area for each session.

Students in the experimental group met nineteen times during the twelve weeks. Each session met for thirty minutes. These meetings were held the last half hour of the school day in a large group instruction area accommodating two classes. The schedule shown in Appendix F was followed.

Each session opened with a brief review of SQ3R. Following this, the students reviewed the practice material from the previous exercise; then the practice material for that day was presented. Students had about half the period to work with content material using the SQ3R. During this time, individual and small group sessions were held as needed.

Students were seated in two different groups of about twenty-seven students each. These large groups were further divided into smaller groups of approximately seven each. This arrangement afforded the opportunity to instruct the total large group and then to work with small groups or individuals. A classroom teacher was with each large group to assist with classroom management.

Procedure for the Control Group

The investigator spent the same amount of class time with the subjects in the control group and the experimental group. The same social studies content was offered each group. The role of the investigator with the control group was that of helping or observing. Each of the four teachers rotated on an equal-time basis for the control group sessions. The control group sessions met for the last thirty minutes of the school day in the large group open area. The chronology of the study is reported in Appendix F.

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CHAPTER IV

ANALYSIS OF DATA

The purpose of this chapter is to report the findings of the study. The current investigation tested five hypotheses formulated to answer these questions.

1. Will the achievement test scores of students who study social studies material using a formally taught study method implementing Survey, Question, Read, Recite, and Review (SQ3R) show significant mean gain over students receiving no instruction in SQ3R?

   a. Will girls who study with the SQ3R show significant mean gain over girls receiving no instruction in the SQ3R?

   b. Will boys who study with the SQ3R show significant mean gain over boys receiving no instruction in the SQ3R?

   c. Will girls who study with the SQ3R show significant mean gain over boys who study with the SQ3R?

2. Will students of a given I.Q. range receiving formal instruction in the SQ3R as a part of their social studies instruction score significantly higher on an achievement test than students from the same I.Q. range receiving no instruction in SQ3R?

3. Will students being taught the SQ3R Study Method score significantly higher on the Use of Sources Test of SRA than students having no instruction in SQ3R?

4. Will students collectively receiving formal instruction in the SQ3R have significantly higher achievement test scores than students having no instruction in SQ3R?

5. Will mean gain scores on achievement tests differ significantly for two groups of students from two different I.Q. ranges when both groups have received instruction in the SQ3R?

Research hypotheses were restated as null hypotheses for the purpose of statistical treatment. Each hypothesis was tested using analysis-of-covariance.

The t-test for differences among several mean (1, p. 112) was used to test Hypotheses I, II, and V to ascertain whether a significant difference existed between the resultant means. The I.Q. scores for Hypotheses II and V were obtained from the CTMM administered by the school counselor. The Social Studies Test of SRA for Hypothesis I, and the Use of Sources Test of SRA for Hypothesis III were administed. Students completed one form of the achievement test at the beginning of the study as a pretest and a different form of the same test at the end of the study as a posttest.

Data Related to Hypothesis I

Null Hypothesis I

Students receiving formal instruction in the SQ3R Study Method will show no significant mean gain in social studies, as measured by the Social Studies Test of SRA, over students having no planned instruction in the SQ3R Study Method.

1. Girls receiving formal instruction in the SQ3R Study Method will have no significant mean gain in social studies, as measured by the Social Studies Test of SRA, over girls having no planned instruction in this method.

2. Boys receiving formal instruction in the SQ3R Study Method will show no adjusted mean gain in social studies, as measured by the Social Studies Test of SRA, over boys having no planned instruction in this method.

3. Girls receiving instruction in the SQ3R Study Method will show no significant mean gain in social studies, as measured by the Social Studies Test of SRA, over boys having instruction in this method.

The data for this hypothesis reporting social studies scores between subjects receiving SQ3R instruction and those receiving no SQ3R instruction are on Table II.

TABLE II

SUMMARY OF COVARIANCE DERIVED FROM DATA ON SOCIAL STUDIES SCORES OF SRA

Source	Sum of Squares	df	Mean Squares	F
Between	0.8253	1	0.8253	0.0370
Column	2.4401	1	2.4401	0.1094
Interaction	17.6906	1	22.3128	0.7928
Within	2164.3406	97	22.3128	--

The F-ratio reported no significant difference among the means; therefore, no further testing for difference between means was undertaken.

Hypothesis I.--In the comparison of means for group instruction in the use of the SQ3R Study Method for social studies, the F-ratio was not significant. Null Hypothesis I, stating that students receiving formal instruction in the SQ3R Study Method will show no significant gain in social studies over students having no planned instruction in SQ3R, was retained.

When F is not significant, there is no reason for further testing, as none of the mean differences will be significant (2, p. 284). Even though there was no significant difference, the means for hypothesis I, Ia, Ib, and Ic were inspected, and these data are reported in Table III.

TABLE III

COMPARISON OF MEANS FROM DATA ON SOCIAL STUDIES SCORES

Subjects	Pretest	Posttest	Rows
Experimental	34.0000	33.8333	-0.1667
Control	34.7708	34.1667	-0.6041
Columns	0.7708	0.3334	-0.4374

These findings are based on the data presented in Table III.

1. On the pretest, the mean for the control group exceeded the experimental group mean by 0.7708.

2. For the posttest, the control group exceeded the experimental group by 0.3334.

3. The mean difference from pretest to posttest was 0.4374.

4. Both groups regressed from pretest to posttest.

5. The experimental group regressed 0.1667 points.

6. The control group declined 0.6041.

7. The experimental means regressed less than the control means.

8. Mean scores for the control group exceeded those of the experimental group on pretest and posttest.

Hypothesis Ia.--Data for the inspection of means for girls in the use of the SQ3R Study Method for social studies are reported in Table IV. Null Hypothesis Ia, stating that girls receiving formal instruction in the SQ3R will not show significant mean gain in social studies over girls having no planned instruction using the SQ3R, was retained. Instruction in the use of the SQ3R Study Method for girls had no significant affect on achievement test scores.

TABLE IV

COMPARISON OF MEANS FROM THE SOCIAL STUDIES TEST OF SRA FOR GIRLS' SCORES

Subjects	Pretest	Posttest	Rows
Experimental	34.8064	34.7742	-0.0322
Control	33.6207	32.6897	-0.9310
Columns	1.1857	2.0845	-0.8988

The means for hypothesis Ia are in Table IV. At the beginning of the study, there was no significant difference between groups as determined by the calculated F-ratio for analysis of covariance. With no significant difference between means, an inspection of mean scores reveals the following:

1. On the pretest, the mean for the experimental group exceeded the control group mean by 1.1857.

2. For the posttest, the mean difference was 2.0845.

3. The mean decreased from pretest to posttest by 0.8988.

4. Data reports a regression in social studies for both groups from pretest to posttest.

5. The experimental group regressed by 0.0322 points.

6. Control group mean differed by 0.9310 with pretest being greater.

7. The experimental group mean regressed less than control group mean from pretest to posttest.

8. Mean scores for the experimental group were greater than mean scores for the control group on pretest and posttest.

Hypothesis Ib.--In testing for significance of Null Hypothesis Ib for the affect of instruction in the use of the SQ3R Study Method for boys in social studies, the F-ratio was not significant at the .05 level of confidence. Null Hypothesis Ib, that boys receiving formal instruction in the SQ3R will show no significant mean gain in social studies over boys having no planned instruction in the SQ3R, was retained. Means from the Social Studies Test of SRA for boys having instruction in the SQ3R and boys having no instruction in SQ3R are reported in Table V.

TABLE V

COMPARISON OF MEANS FROM THE SOCIAL STUDIES TEST OF SRA FOR BOYS

Subjects	Pretest	Posttest	Rows
Experimental	32.9130	32.5652	-.3478
Control	36.5263	36.4211	-.1052
Columns	3.6133	3.8559	-0.2426

Inspection of data in Table V for Hypothesis Ib prompts the following:

1. On the pretest, the control group mean exceeded the experimental group mean by 3.6133.

2. Posttest mean difference was 3.8559 with the control group mean greater.

3. Mean difference from pretest to posttest was 0.2426.

4. Posttest means were lower than pretest means for both groups.

5. The experimental group mean dropped 0.3478 points.

6. The control group declined 0.1052 points.

7. The experimental group regressed more than the control group.

8. Scores on the pretest and the posttest were greater for the control group.

Hypothesis Ic.--The F-ratio was not significant at the .05 level of confidence in comparing the performance of boys to girls for the effect of instruction in the use of the SQ3R Study Methods. The null hypothesis, that girls will have no significant mean gain over boys when both receive instruction in the SQ3R Study Method, was retained. The data in Table VI are reported for inspection of the means from the Social Studies Test.

TABLE VI

COMPARISON OF MEANS FROM THE SOCIAL STUDIES TEST OF SRA FOR GIRLS RECEIVING THE SQ3R INSTRUCTION AND BOYS RECEIVING THE SQ3R INSTRUCTION

Subject	Pretest	Posttest	Rows
Boys	32.9130	32.5652	-0.3478
Girls	34.8064	34.7742	-0.0322
Columns	1.8934	2.2090	-0.3156

Mean scores yield data for the following observations:

1. Mean score for girls on the pretest was higher than pretest mean score for boys by 1.8934.

2. On the posttest, girls exceeded boys by 2.2090.

3. Mean difference from pretest to posttest was 0.3156.

4. Scores lowered for boys and girls from pretest to posttest.

5. Boys regressed 0.3478.

6. Girls regressed 0.0322.

7. Regression for girls was less than for boys.

8. Mean scores for girls were higher than for boys on pretest and posttest.

Data Related to Hypothesis II

Null Hypothesis II

Students of a given I.Q. range in the experimental group will show no significant mean gain on the SRA given at the end of the study over students in the same I.Q. range from the control group.

1. Students in the experimental group with an I.Q. score below 90, as measured by CTMM, will show no significant mean gain on the SRA given at the end of the study over students in the same I.Q. range from the control group.

2. Students in the experimental group with an I.Q. score (90-109), as measured by CTMM, will show no significant mean gain on the SRA given at the end of the study over students in the same I.Q. range from the control group.

3. Students in the experimental group with an I.Q. score of above 109, as measured by CTMM, will show no significant mean gain on the SRA given at the end of the study over students in the same I.Q. range from the control group.

Data for this hypothesis reporting a significant F-ratio for results from the SRA Composite Test scores are in Table VII.

TABLE VII

SUMMARY OF COVARIANCE DERIVED FROM DATA ON COMPOSITE SCORES ON THE SRA

Source	Sum of Squares	df	Mean Squares	F
Between	28.1925	1	28.1925	1.0922
Column	168.1845	2	84.0922	3.2579*
Inter-action	108.5610	2	54.2805	2.1029
Within	2452.1545	95	25.8122	--

*Significant at the .05 level of confidence.

The comparison of I.Q. means and treatment means yields a significant F-ratio of 3.2579 compared to the required F for significance at the .05 level of confidence of 3.10. To determine where this significance lies, the t-test for differences among several means was used to test for the significance of the difference between means for Hypotheses IIa, IIb, and IIc. The hypothesis tested was that students of a given I.Q. range who received instruction in the SQ3R Study Method would show significant mean gain over students of a like I.Q. range receiving no instruction in the study method. The hypothesis was stated in three parts.

Hypothesis IIa.--This hypothesis was a comparison of the mean scores for the low I.Q. group (below 90) from the two

treatment groups. The data are reported in Table VIII for comparison of these means.

The Null Hypothesis IIa, which states that students in the experimental group with an I.Q. score below 90 will have no significant mean gain over students in the same I.Q. range from the control group, is retained. Means for this data are reported in Table VIII.

TABLE VIII

MEAN SCORES ON THE SRA COMPOSITE TEST FOR LOW I.Q. SUBJECTS

Subjects	Pretest	Posttest	Rows
Experimental	42.4545	44.8182	2.3637
Control	34.7500	42.5000	7.7500*
Columns	7.7045	2.3182	5.3863

*Significant at the .05 level of confidence.

The t-test for difference among several means was used to determine which means differ significantly. The critical difference to test the difference between these means is 6.11. If the difference between any two means is larger than the critical difference (6.11 in this case), then the means are assumed to be significantly different.

There is significant difference between the mean for the experimental group on the pretest (42.4545) and pretest mean for the control group (34.7500). This difference of 7.7045 exceeds the critical difference of 6.11; however, this difference is not involved with Hypothesis IIa. The control group pretest mean (34.7500) and the control group posttest mean (42.500) differed by 7.7500, which exceeded the critical difference of 6.11. This significant difference is not involved with Hypothesis IIa.

Further inspections of the means in Table VIII reveals the following:

1. Mean scores for the experimental group were higher than mean scores for the control group.

2. On the posttest, the experimental mean exceeded the control mean by 2.3182.

3. Mean difference for both groups from pretest to posttest was 5.3863.

4. Scores for both groups increased from pretest to posttest.

5. The experimental group increased 2.3637.

6. The control group increased 5.3863.

7. Gain from pretest to posttest for the control group surpassed the gain for the experimental group even though their scores were lower.

Hypothesis IIb.--This hypothesis was a comparison of the mean scores for the middle I.Q. group (90-109) from the two treatment groups. Data for Hypothesis IIb are reported in Table IX.

The Null Hypothesis IIb, students in the experimental group with an I.Q. of 90-109 will show no significant mean gain over students in the same I.Q. range from the control group, is retained.

TABLE IX

MEAN SCORES ON THE SRA FOR MIDDLE I.Q. SUBJECTS

Subjects	Pretest	Posttest	Rows
Experimental	62.7500	62.800	0.0500
Control	59.5217	58.2174	1.3043
Columns	3.2283	4.5826*	1.3543

*Significant at the .05 level of confidence.

To test for the difference between means using the t-test for difference among several means, a critical difference score (in this case 3.26) was obtained. If the difference between any two means is larger than the critical difference, the means are assumed to be significantly different. The following observations are made on the data in Table IX:

1. Experimental group means were larger for pretest and posttest.

2. On the posttest, the experimental group exceeded the control group by 4.5826.

3. On the pretest, the experimental group mean exceeded the control group mean by 3.2283.

4. Scores for the experimental group increased slightly (0.0500) from pretest to posttest.

5. Control group scores decreased from pretest to posttest by 1.3043.

6. Difference in mean gain between groups was 1.3543.

Even with significance between posttest means, the Null Hypothesis, students in the experimental group with an I.Q. 90-109 would show no significant mean gain over students in the same I.Q. range from the control group, is retained. Significant mean gain was hypothesized.

Hypothesis IIc.--This hypothesis was a comparison of the mean scores for the high I.Q. group (above 109) from the two treatment groups. This data is reported in Table X.

The Null Hypothesis IIc, students in the experimental group with an I.Q. above 109 will show no significant mean gain over students in the same I.Q. range from the control group, is retained.

TABLE X

MEAN SCORES ON THE SRA FOR HIGH I.Q. SUBJECTS

Subjects	Pretest	Posttest	Rows
Experimental	73.4783	74.3478	0.8695
Control	74.5238	76.4762	1.9524
Columns	1.0455	2.1284	1.0829

To determine which, if any, specific means differ significantly, the t-test for difference among means was used. For Table X, a critical difference value of 3.152 was calculated. If the difference between any two means is greater than this critical difference, then the means are assumed to be significantly different at the .05 level of confidence.

The data in Table X support the following observations:

1. Pretest scores for the experimental group were lower than for the control group (1.0455).

2. Posttest scores were higher for the control group (2.1284).

3. The mean difference for both groups from pretest to posttest was 1.0829.

4. Scores were higher on posttest over pretest for both groups.

5. Difference in pretest and posttest scores for the experimental group was 0.8695.

6. Difference in pretest and posttest scores for the control group was 1.9524.

7. The increase from pretest to posttest was greater for the control group.

8. Pretest and posttest mean scores were higher for the control group.

The Null Hypothesis IIc, students in the experimental group with an I.Q. score above 109 would show no significant mean gain over students of the same I.Q. range from the control group, is retained. The mean difference was 1.0829 which is less than the computed critical difference value of 3.152.

Data Related to Hypothesis III

Null Hypothesis III

For the Use of Sources Test of the SRA, the experimental group will show no significant mean gain over students in the control group from pretest to posttest. Data for this hypothesis are reported in Table XI.

TABLE XI

SUMMARY OF COVARIANCE DERIVED FROM DATA ON THE USE OF SOURCES TEST OF THE SRA

Source	Sum of Squares	df	Mean Squares	F
Between	00.2804	1	0.2804	0.0083
Column	34.4829	2	17.2415	0.5114
Interaction	190.9727	2	95.4865	2.8325
Within	3202.5469	95	33.7110	--

There was no significant difference among the means for the Use of Sources Test of SRA.

Null Hypothesis III.--No significant difference was reported on the Use of Sources Test for children being taught the SQ3R Study Method and those in the control group receiving no instruction in the use of the SQ3R Study Method. The F-ratio from the data on the Use of Sources Test of SRA was below 3.10, the level required for significance, indicating retention of the null hypothesis. Even with Null Hypothesis III retained with no significant difference, certain items worthy of note can be seen by an inspection of means. This summary of mean scores is in Table XII.

TABLE XII

SUMMARY OF MEAN SCORES DERIVED FROM DATA ON THE USE OF SOURCES TEST OF THE SRA

Subjects	Pretest	Posttest	Rows
Experimental	34.1481	34.5185	0.3704
Control	35.9792	37.3333	1.3541
Columns	1.8311	2.8148	0.9837

The following observations are based on Table XII.

1. Control group means were larger for pretest and posttest.

2. Both groups had increased means for posttest over pretest.

3. The experimental means increased 0.3704 from pretest to posttest.

4. Means for the control group increased 1.3541 from pretest to posttest.

5. Total mean gain for both groups was 0.9837.

6. The increase from pretest to posttest was greater for the control group (1.3541) than for the experimental group (0.3704).

Data Related to Hypothesis IV

Null Hypothesis IV

Students receiving formal instruction in the SQ3R Method of Study will have no significant mean gain on the SRA over students having no instruction in the SQ3R Method of Study. Data for this hypothesis are reported in Table XIII.

TABLE XIII

SUMMARY OF COVARIANCE DERIVED FROM DATA ON COMPOSITE TEST SCORES ON THE SRA

Source	Sum of Squares	df	Mean Squares	F
Between	0.9869	1	0.9869	0.0350
Column	51.3355	1	51.3355	1.8197
Interaction	20.6620	1	20.6620	0.3942
Within	2736.5134	97	28.2115	--

For the composite scores of the pretest and posttest scores, Hypothesis IV was formulated to test for significant difference between the pretest and posttest for the experimental and control groups. This is shown in Table XIV. The means for composite scores for the treatment group does not meet the F-ratio for significance. The Null Hypothesis of no difference is retained since the F-ratio is less than the 3.95 required level for significance.

The difference in pretest and posttest scores and the difference for Hypothesis IV is shown in Table XIV.

TABLE XIV

SUMMARY OF MEAN SCORES DERIVED FROM DATA ON THE COMPOSITE TEST RESULTS OF THE SRA

Subjects	Pretest	Posttest	Rows
Experimental	63.1852	64.0555	0.9703
Control	64.0208	64.8958	0.8750
Columns	0.8356	0.8403	0.0047

Data in Table XIV are discussed in these statements.

1. Control group means were greater than experimental group means on pretest and posttest.

2. The means increased for each group from pretest to posttest.

3. Mean gain for the control group (0.8750) was slightly more than mean gain for the experimental group (0.8703).

Data Related to Hypothesis V

Null Hypothesis V

Students in the experimental group with higher I.Q. scores, as measured by the CTMM, will show no significant mean gain, as measured by the SRA, over students with lower I.Q. scores.

1. Students in the experimental group with an I.Q. of 90-109, as measured by the CTMM, will show no significant mean gain, as measured by the SRA, over those students in the experimental group with an I.Q. score below 90.

2. Students in the experimental group with I.Q. scores above 90, as measured by CTMM, will have no significant mean gain, as measured by the SRA, over students in the experimental group with 90-109 I.Q.

3. Students in the experimental group with I.Q. scores above 109, as measured by CTMM, will have no significant mean gain, as measured by the SRA, over students in the experimental group with I.Q. scores below 90.

Data for this hypothesis are reported in Table XV with I.Q. as a control variable and achievement as the criterion variable.

TABLE XV

SUMMARY OF COVARIANCE DERIVED FROM DATA ON COMPOSITE SCORES ON THE SRA AND I.Q. SCORES FROM THE CTMM

Source	Sum of Squares	df	Mean Squares	F
Between	28.1925	1	28.1925	1.0922
Column	168.1845	2	168.1845	3.2579*
Interaction	108.5610	2	54.2805	2.0290
Within	2452.1545	95	25.8122	--

*Significant at the .05 level of confidence.

Hypothesis Va.--Hypothesis V was a comparison between three I.Q. groups: high, middle, and low. Hypothesis Va compares middle I.Q. range (90-109) with low I.Q. range (below 90). Students from the low I.Q. group increased their mean score from pretest to posttest more than middle I.Q. group pupils; however, this difference was not significant. The Null Hypothesis was retained.

With a significant F-ratio, it was necessary to do a t-test to identify the means that differed significantly. This test revealed a difference in mean scores for the different I.Q. levels, but the hypothesis was that of mean gain. There was no significant difference in mean gain. Mean scores and differences among the means are shown in Table XVI for middle I.Q. groups (90-109) and low I.Q. groups (below 90).

TABLE XVI

SUMMARY OF MEAN SCORES DERIVED FROM DATA ON THE COMPOSITE SCORES OF THE SRA FOR MIDDLE AND LOW I.Q. SUBJECTS

Subjects	Pretest	Posttest	Rows
Middle I.Q. (90-109)	62.7500	62.8000	0.0500
Low I.Q. (Below 90)	42.4545	44.8182	2.3637
Columns	20.2955	17.9818	2.3137

The following comments are based on the data in Table XVI:

1. Both I.Q. groups had mean gain from pretest to posttest.

2. The total mean gain for both groups was 2.3137.

3. The difference in group means from pretest to posttest decreased.

4. Low I.Q. (below 90) students made greater mean gain than middle I.Q. (90-109) students.

To test for significance between means, the t-test for differences among several means was computed, using the correction for disparate n's. For Hypothesis Va, the critical difference value was 3.19. The low group with a mean difference of 2.3637 was closer for significance at the .05 level of confidence than the middle I.Q. group with a difference of 0.0500.

The Null Hypothesis, that middle I.Q. (90-109) pupils would show no significant mean gain over pupils in the low I.Q. range (below 90), is retained.

Hypothesis Vb.--In testing for significance between the high I.Q. group (above 109) and the middle I.Q. group (90-109), both sets of means showed a slight increase from pretest to posttest. There was a greater difference from pretest to posttest for the middle group. This difference, however, was not significant. The Null Hypothesis was retained. These data are presented in Table XVII.

TABLE XVII

SUMMARY OF MEAN SCORES DERIVED FROM DATA ON THE COMPOSITE SCORES OF THE SRA FOR HIGH AND MIDDLE I.Q. SUBJECTS

Subjects	Pretest	Posttest	Rows
High I.Q. (Above 109)	73.4783	74.3478	0.8695
Middle I.Q. (90-109)	62.7500	62.8000	0.0500
Columns	10.7283	11.5478	0.8195

There are significant differences between means on Table XVII, but mean gain was hypothesized and there is no significant difference in mean gain.

Mean scores recorded in Table XVII are discussed below.

1. High I.Q. subjects have higher pretest and posttest means.

2. Both high and middle I.Q. groups scored higher on posttest than on pretest.

3. The difference between means was greater after the posttest than after the pretest.

Difference between means was tested with the t-test for differences among several means. The critical difference value was 3.19. None of the mean differences was larger than the critical difference.

The Null Hypothesis, that students in the experimental group with I.Q. scores above 109 will have no significant mean gain over those in the experimental group with I.Q.'s of 90-109, is retained.

Hypothesis Vc.--This hypothesis tested the difference between the high I.Q. group (above 109) and the low I.Q. group (below 90). Neither high nor low I.Q. group had significant difference from pretest to posttest within the group. The mean score for the low group showed greater increase from pretest to posttest than did the mean of the high I.Q. group; however, this difference was not significant. The Null Hypothesis was retained.

The significant difference shown in the F-ratio in Table XV, page 88, was between low experimental group and low control group. This was dealt with in Hypothesis II. Means for this hypothesis are reported in Table XVIII.

TABLE XVIII

SUMMARY OF MEAN SCORES DERIVED FROM DATA ON THE COMPOSITE SCORES OF THE SRA FOR HIGH AND LOW I.Q. SUBJECTS

Subjects	Pretest	Posttest	Rows
High I.Q. (Above 109)	73.4783	74.3478	0.8695
Low I.Q. (Below 90)	42.4545	44.8182	2.3637
Columns	31.0238	29.5296	1.4942

There are significant differences between the means, but mean gain is not significant. The means and their differences shown in the above table are discussed in the following statements:

1. Pretest and posttest means were higher for the higher I.Q. group (above 109).

2. Mean gain from pretest to posttest was greater for the low I.Q. group (below 90).

3. The difference between means for high I.Q. (above 109) and low I.Q. (below 90) groups was greater on the pretest than on the posttest.

A t-test for differences among several means was computed to test the differences in these means.

The critical difference figure was determined to be 3.82. If the difference between any two means is larger than this figure, the means are assumed to be significantly different. None of the mean differences in Table XVIII meets this requirement. The Null Hypothesis, that students in the experimental group with I.Q. scores above 109 will have no significant mean gain over those students in the experimental group with I.Q. scores below 90, is retained.

Data Collected But Not Hypothesized

An achievement test was given at the beginning of the experiment as a pretest. Another form of this same achievement test was given at the end of the experiment as a posttest. These achievement tests had subtests which were not a part of the hypothesis for this study.

An interval test for social studies was given after the mid-point of this study. Data from these additional measures are reported here.

Interval Test

A comparison of the social studies results from the pretest, the posttest, and the interval test are reported in Figure 2.

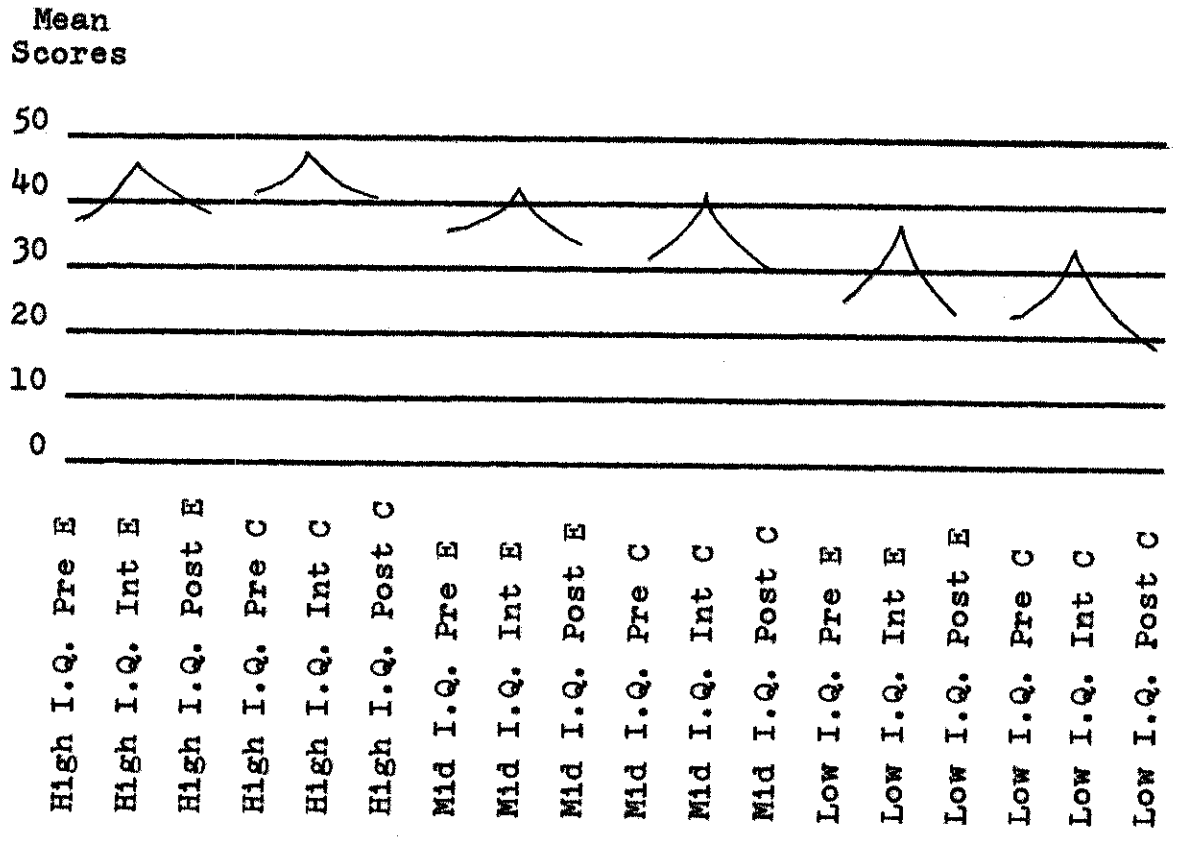

Fig. 2--A comparison of social studies test means from the Pretest, the Posttest, and the Interval Test.

The purpose of the interval test was to chart the progress of the experimental group and compare its performance to the performance of the control group on the same test. Scores on the interval test ran high for both groups. The reason for this is unknown. The data from Figure 2 reveals the following

1. For each I.Q. group, there was significant difference between the pretest means and the interval test means. This was also true for the posttest means and the interval test means.

2. No significant difference was measured between the different I.Q. groups for performance on the interval test.

3. Inspection of means revealed that interval scores, though quite high, ran the same pattern for experimental and control groups. This ruled out the possibility of the higher mean scores resulting from the experimental treatment; therefore, the procedure for experimental class meetings was not affected by the results of the interval test.

Reading

Data for the scores from the SRA Reading Test are reported in Table XIX. These data are for students having instruction in the SQ3R compared to students having no instruction in the SQ3R.

TABLE XIX

SUMMARY OF COVARIANCE DERIVED FROM DATA ON READING SCORES FROM THE SRA

Source	Sum of Squares	df	Mean Squares	F
Between	9.5730	1	9.5730	0.1268
Column	15.8930	1	15.8930	0.2104
Interaction	378.9528	1	378.9528	5.0176
Within	7325.9527	97	75.5253	--

The significance noted for interaction on this test occurred between posttest means for control group boys and experimental group boys, experimental group boys and experimental group girls, and control group boys and control group girls. This study was concerned with significant mean gain from pretest to posttest rather than posttest differences. An inspection of these same means on the pretest indicates that a difference, though not significant, existed at the beginning of the study.

Data on mean scores are presented in Table XX.

TABLE XX

MEAN SCORES FOR THE READING TEST FROM THE SRA

Subjects	Pretest	Posttest	Rows
Experimental	58.0555	58.5741	0.5186
Control	61.5417	61.3750	0.1667
Columns	3.4862	2.8009	0.3519

The reading test was part of the achievement series given as pretest and posttest. A summary of the data shown above is discussed as follows:

1. Control subjects scored higher on pretest and posttest.

2. Control subjects scored lower on the posttest than they did on the pretest.

3. The mean for the experimental group was higher on the posttest than on the pretest with a difference of 0.5186.

4. On the pretest, the control group surpassed the experimental group by 3.4862.

5. On the posttest, this difference was reduced from 3.4862 to 2.8009.

(The F-ratio of 0.3320 was less than the 3.10 required for significance at the .05 level.)

Language Arts

The language arts data compares pretest and posttest for children being taught the SQ3R Study Method and those having no such instruction. Language arts data are shown on Table XXI.

TABLE XXI

SUMMARY OF COVARIANCE DERIVED FROM DATA ON LANGUAGE ARTS SCORES FROM SRA

Source	Sum of Squares	df	Mean Squares	F
Between	12.6778	1	12.6778	0.2348
Column	454.5308	1	454.5308	8.4167*
Interaction	15.1713	1	15.1713	0.2809
Within	5238.3295	97	54.0034	--

The significant difference indicated in Table XXI was the difference between the posttest scores for girls compared to boys. To compare these means, a t-test for the difference among means was used. The means tested are shown in Table XXII.

TABLE XXII

DATA FOR LANGUAGE ARTS PERFORMANCE FOR STUDENTS BEING INSTRUCTED IN THE SQ3R STUDY METHOD COMPARED TO THOSE NOT RECEIVING THIS INSTRUCTION

Subjects	Pretest	Posttest	Rows
Experimental	70.3704	71.6667	1.2963
Control	71.3542	73.2083	1.8541
Columns	1.0162	1.5416	.5578

A summary of the data in the table is given below.

1. Mean scores on the pretest and the posttest were higher for the control group.

2. Both groups raised their mean score on the pretest over the posttest.

3. The control group had the greater increase.

The calculated F-ratio of 0.2348 was less than the 3.95 required for significance at the .05 level. There was no significant difference between the experimental and the control group means for pretest to posttest.

Science

Scores from the Science Test of SRA were statistically tested for a significant difference. The computed F-ratio reported no significant difference between means. These data are reported in Table XXIII.

TABLE XXIII

SUMMARY OF COVARIANCE DERIVED FROM DATA ON SCIENCE SCORES FROM SRA

Source	Sum of Squares	df	Mean of Squares	F
Rows	23.4939	1	23.4939	0.4501
Columns	23.1882	1	23.1882	0.4441
Interaction	72.6577	1	72.6577	1.3920
Within	5062.9513	97	52.1954	--

The data in Table XXIII indicates no significant difference in subjects having instruction in the SQ3R and those having no instruction in the SQ3R; however, there were some mean gains. A comparison among the means is shown in Table XXIV.

TABLE XXIV

MEAN DATA ON THE SCIENCE TEST FROM SRA

Subjects	Pretest	Posttest	Rows
Experimental	33.0555	33.6481	0.5926
Control	35.7292	36.2917	0.0301
Columns	2.6737	2.6436	0.0301

The data in Table XXIV are summarized below.

1. Control group means were higher on pretest and posttest.

2. Both groups scored higher on posttest than on pretest.

3. Increase from pretest to posttest was greater for experimental groups (0.5926) than for control groups (0.5625).

4. On the pretest, the control group mean exceeded the experimental group mean by 2.6436.

The F-ratio of 0.4501 was less than the 3.95 required for significant difference at the .05 level of confidence.

Mathematics

The SQ3R Study Method is not intended for study in mathematics; however, the data on the Mathematics Test of SRA was tested in the study and the statistical results are reported in Table XXV.

TABLE XXV

SUMMARY OF COVARIANCE DERIVED FROM DATA ON MATHEMATICS SCORES FROM SRA

Source	Sum of Squares	df	Mean Squares	F
Between	1007.5555	1	1007.5555	0.1929
Column	27.3502	1	27.3502	0.0052
Interaction	405.5131	1	405.5131	0.0776
Within	5065.3337	97	5222.4777	--

Mathematics data were taken from the SRA given as pretest and posttest for this study. There were no significant differences among the means, but additional information is available from an inspection of the means. The means are shown in Table XXVI.

TABLE XXVI

MEAN DATA ON THE MATHEMATICS TEST FROM SRA

Subjects	Pretest	Posttest	Rows
Experimental	52.8704	51.9259	0.9445
Control	52.1042	50.5833	1.5209
Columns	0.7662	1.3426	0.5764

Discussion of the data in Table XXVI is presented here.

1. Experimental group mean scores exceeded control group scores on pretest and posttest.

2. The difference was greater on posttest (1.3426) than on pretest (0.7662).

3. Both groups regressed from pretest to posttest.

4. Less decline was reported for the experimental group.

The F-ratio of 0.1929 was less than the 3.95 required for significance at the .05 level of confidence.

Further Observations

Further observations indicate observed behavior not measured by the instruments. These observations indicated that

1. Students in the experimental group were receptive to a new approach to the study of content material.

2. With a group of fifty-four students working on the experimental approach at the same time, there were practically no discipline problems.

3. Very few students in the experimental group failed to complete the SQ3R Study-Method-related assignments.

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CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Summary

The major purpose of this investigation was concerned with the problem of determining the effects of the SQ3R Study Method instruction upon the achievement of students in fifth grade social studies. In order to assess the effects, two groups of students were given an achievement test before and after the experiment. During the experiment, one group received instruction in the SQ3R Study Method and served as the experimental group while another group received no instruction in the SQ3R Study Method and served as the control group. In seeking a solution to the problem, answers were sought to the following questions:

1. Will instruction in the SQ3R improve achievement test scores in social studies?

2. If results are positive after instruction in the SQ3R, will these be the same for both sexes?

3. When achievement test results are observed on the basis of high (above 109), middle (90-109), or low (below 90) I.Q., will students receiving instruction in the SQ3R

Study Method improve their test scores over students in the same I.Q. range receiving no instruction?

4. Can instruction in the SQ3R Study Method improve students' use of sources as measured by the Use of Sources portion of the achievement test?

5. Will instruction in the SQ3R improve achievement test scores on the composite test of the SRA?

6. When achievement test results are observed on the basis of I.Q., will study-method instruction be of more benefit to the low (below 90), the middle (90-110), or the high (above 110) I.Q. groups?

Question One

In order to find the answer to question one, Hypotheses I, a and b, were formulated:

1. Students receiving formal instruction in the SQ3R will show significant mean gain in social studies, as measured by the Social Studies Test of SRA, over students having no planned instruction using the SQ3R.

a. Girls receiving formal instruction in the SQ3R will show significant mean gain in social studies, as measured by the Social Studies Test of SRA, over girls having no planned instruction using the SQ3R.

b. Boys receiving formal instruction in the SQ3R will show significant mean gain in social studies, as measured

by the Social Studies Test of SRA, over boys having no planned instruction in the SQ3R.

Question Two

The answer to question two required the testing of Hypothesis Ic.

c. Girls receiving instruction in the SQ3R will show significant mean gain in social studies, as measured by the Social Studies Test of SRA, over boys having instruction in the SQ3R.

Question Three

Question three required the testing of the following hypothesis:

2. Students of a given I.Q. range in the experimental group will show significantly greater mean gain on the SRA given at the end of the study than will students in the same I.Q. range from the control group.

a. Students in the experimental group with an I.Q. score below 90, as measured by the CTMM, will show significant mean gain on the SRA given at the end of the study over students in the same I.Q. range from the control group.

b. Students in the experimental group with an I.Q. score 90-109, as measured by CTMM, will show significant mean gain on the SRA given at the end of the study over students in the same I.Q. range from the control group.

c. Students in the experimental group with an I.Q. above 109, as measured by CTMM, will show significant mean gain on the SRA given at the end of the study over students in the same I.Q. range from the control group.

Question Four

The answer to question four required the testing of the following hypothesis:

3. For the Use of Sources Test of the SRA, the experimental group will have significant mean gain over students in the control group from pretest to posttest as measured by the SRA.

Question Five

In order to find the answer to question five, the following hypothesis was formulated:

4. Students receiving formal instruction in the SQ3R Method of Study will have significant mean gain over students having no instruction in the SQ3R Method of Study as measured by the SRA.

Question Six

Question six required the testing of the following hypothesis:

5. Students in the experimental group with higher I.Q. scores, as measured by the CTMM, will show significant mean gain, as measured by the SRA, over students with lower I.Q. scores.

a. Students in the experimental group with I.Q. of 90-109, as measured by the CTMM, will show significant mean gain, as measured by the SRA, over those in the experimental group with I.Q. scores below 90.

b. Students in the experimental group with I.Q. scores above 109, as measured by CTMM, will have significant mean gain, as measured by the SRA, over those in the experimental group with 90-109 I.Q.

c. Students in the experimental group with I.Q. above 109, as measured by CTMM, will have significant mean gain, as measured by the SRA, over those in the experimental group with I.Q. scores below 90.

Subjects for the Investigation

Subjects for the investigation were the 102 fifth grade students attending one elementary school in north Texas.

Experimental Design

Students in the study were assigned to either an experimental or a control group each of which met for nineteen sessions of approximately thirty minutes each. During these nineteen sessions, students in the experimental group were given instruction in the use of the SQ3R Study Method in social studies while the control group received the same content instruction but no instruction in use of the SQ3R Study Method.

Instruments

The instrument employed to measure achievement was the Science Research Associates Assessment Survey, Blue Level (SRA). Form E was used as a pretest and Form F as the posttest. The interval test given between the pretest and the posttest was the Social Studies Test of SRA, Form E. I.Q. scores were from the California Short Form Test of Mental Maturity (CTMM).

Statistical Treatment

After collection of data, the tenability of the hypotheses of the study was tested by the analysis of covariance (two-way design). If a significant F-ratio was calculated, the t-test for difference among several means was used to determine which means differed significantly.

1. The research hypotheses were restated in the null form.

2. All hypotheses were subjected to the analysis of covariance (two-way design).

3. The t-test for difference between means was calculated for Hypotheses Ia, Ib, Ic, IIa, IIc, Va, Vb, and Vc.

4. The findings were arbitrarily rejected or retained at the .05 level of confidence.

Findings

The findings of this investigation are limited to the school in which the data were gathered. It is not intended

that the findings be generalized to other situations dissimilar to those described for this experiment.

Hypothesis I

There were no significant differences in the mean scores in social studies achievement between the students in the experimental and control groups. The null hypothesis was retained.

Hypothesis Ia

Scores in social studies achievement of girls in the experimental group and girls in the control group were not significantly different. The null hypothesis was retained.

Hypothesis Ib

Experimental group boys had scores in social studies achievement which did not differ significantly from achievement test scores for control group boys. The null hypothesis was retained.

Hypothesis Ic

There were no significant differences in the social studies achievement test scores of girls in the experimental group compared to these scores of boys in the experimental group.

Hypothesis II

No significant differences were found from pretest achievement scores to posttest achievement scores between experimental and control group subjects of the same I.Q. range. The null hypothesis was retained.

Hypothesis IIa

Achievement scores on composite posttest for students in the experimental and control groups did not differ significantly for students in the low I.Q. range (below 90). The null hypothesis was retained.

Hypothesis IIb

Students of the experimental and the control groups in the middle I.Q. range (90-109) did not score significantly different on the composite posttest of achievement. The null hypothesis was retained.

Hypothesis IIc

Composite posttest achievement scores for students in the experimental and control groups from the high I.Q. range (above 109) did not differ significantly. The null hypothesis was retained.

Hypothesis III

There was no significant difference in the achievement mean scores for the Use of Sources Test of SRA between

students in the experimental group and students in the control group. The null hypothesis was retained.

Hypothesis IV

For subjects in the experimental and control groups, there was no significant difference on posttest means from the composite achievement test scores. The null hypothesis was retained.

Hypothesis V

Mean gain for students from different I.Q. ranges in the experimental group was not significant on the achievement posttest. The null hypothesis was retained.

Hypothesis Va

There was no significant difference in mean gain for students in the experimental group when achievement scores from the posttest were compared for students in the middle I.Q. range (90-109) with students in the low I.Q. range (below 90). The null hypothesis was retained.

Hypothesis Vb

Subjects from the experimental group in the high I.Q. range (above 109) compared to subjects in the middle I.Q. range (90-109) had no significant difference in posttest achievement test scores. The null hypothesis was retained.

Hypothesis Vc

Scores on the achievement posttest for experimental subjects from the high I.Q. range (above 109) and the low I.Q. range (below 90) did not differ significantly on mean gain. The null hypothesis was retained.

Conclusions

Question One

Will instruction in the SQ3R Study Method improve achievement test scores in social studies?

1. Based on the findings for Hypothesis I, the following conclusions are drawn:

a. Teaching the SQ3R Study Method for a short period of time (12 weeks), for approximately thirty minutes twice each week cannot be expected to affect student achievement in social studies.

b. Girls who work with the SQ3R Study Method for twelve weeks as stated above cannot be expected to perform differently in social studies from girls who have done no work with the SQ3R Study Method.

c. Boys being taught the SQ3R Study Method cannot be expected to differ significantly on a social studies standardized test from those having no experience with the SQ3R Study Method.

Question Two

If there are positive results after instruction in the SQ3R Study Method, will these results be the same for both sexes?

1. Data for this question are found in the data for Hypothesis I, part Ic.

a. Girls cannot be expected to improve social studies scores any more than boys after both have been taught to work with the SQ3R Study Method.

Question Three

When achievement test results are observed on the basis of high, middle, and low I.Q., will students receiving instruction in the SQ3R Study Method improve their test scores over students in the same I.Q. range not using the SQ3R?

1. Based upon the findings for Hypothesis II, the following may be concluded:

a. When students of the same I.Q. range are compared on SRA composite test scores after one group has been given practice in using the SQ3R Study Method, no significant difference in performance can be expected.

b. Subjects having low I.Q.'s (below 90) taught the SQ3R Study Method cannot be expected to perform differently from subjects from the same I.Q. range who have received no instruction in the SQ3R Study Method. No significant difference in performance can be expected to result from work with the SQ3R Study Method.

c. Subjects in the middle I.Q. range (90-109) who have been taught the SQ3R Study Method and those of the

same range who have not can be expected to have like mean scores on achievement tests.

d. No significant difference can be expected for two groups of subjects with high I.Q. (above 109) after one group has been given lessons using the SQ3R Study Method.

Question Four

Can instruction in the SQ3R Study Method improve students' use of sources, as measured by the Use of Sources portion of the SRA?

1. After testing Hypothesis III, the data support the conclusion that

a. No significant mean gain on Use of Sources Test scores can be expected in comparing scores of subjects using the SQ3R Study Method and those not using this method.

b. Subjects who score higher at the beginning of such an experiment can be expected to score higher at the conclusion of this type of study using the SQ3R Study Method.

Question Five

Will instruction in the SQ3R improve achievement test scores on the Composite Test of SRA?

Question five may be answered from the data related to Hypothesis IV which support these conclusions:

a. Students using the SQ3R Study Method for twelve weeks will not score significantly higher than those having no work with this method.

b. Subjects scoring higher on the pretest for such an investigation can also be expected to score higher on the posttest.

Question Six

When achievement test results are observed on the basis of I.Q., will study-method instruction be of more benefit to the low I.Q. (below 90), middle I.Q. (90-109), or high I.Q. (above 109) students?

1. The findings for Hypothesis V offer data to answer Question Six with these conclusions:

a. No significant difference in mean gain can be expected in comparing the mean scores of middle I.Q. (90-109) pupils with the mean scores of low I.Q. (below 90) pupils after each group has attended classes in the use of the SQ3R Study Method.

b. Low I.Q. groups can be predicted to have greater mean gain than middle I.Q. groups after each has completed twelve weeks of work with the SQ3R Study Method.

c. In comparing high I.Q. (above 109) and low I.Q. (below 90) subjects, it may be expected that the mean gain will be greater from pretest to posttest for low I.Q. (below 90) students; however, this difference cannot be expected to be significant.

Implications

Inferred by Analysis of Findings and Conclusions

The following implications were inferred from an analysis of the findings and conclusions in this study:

1. The data related to Question One relevant to Hypothesis I, parts Ia, and Ib, imply that the SQ3R Study Method should not be adopted for large scale use by all students on the basis of this study.

2. The data relevant to Question Two related to Hypothesis Ic support the implication that girls can be expected to score higher than boys on a social studies achievement test, and the data imply that this difference can be anticipated to continue with or without both sexes having received the opportunity to use the SQ3R Study Method in social studies.

3. The data related to Question Three imply that students at any I.Q. level using the SQ3R Study Method will continue to achieve as they did before studying with the SQ3R.

4. Question Four data related to Hypothesis III imply that students in the fifth grade probably will not improve their use of source materials such as the dictionary, the encyclopedia, or the index after working with the SQ3R Study Method.

5. In answering Question Five, data from Hypothesis IV imply that performance on achievement tests cannot be expected to change in relation to limited practice with the SQ3R Study Method.

6. Question Six related to Hypothesis V provides data to support the implication that there is little correlation for high I.Q. (above 109), middle I.Q. (90-109), or low I.Q. (below 90) pupils related to performance on achievement tests after practice in the use of the SQ3R.

Inferred by Observation During the Course of the Investigation

1. In elementary school, the ability to read the textbook is often accepted as having developed proper study techniques.

2. Assignments follow a somewhat set pattern that is the same regardless of the discipline.

3. A high percentage of classroom teachers seem to have had some form of a how-to-study program in college but have not offered similar assistance to the students they teach.

4. Much of the instruction in social studies is conducted with the assumption that students have proper study habits without the teacher having determined if this is true.

5. The ability to study needs to be relevant to the individual who has the need to study and to the content that is to be the object of the study.

Recommendations for Further Research

1. Better methods are needed to evaluate the study habits of elementary school children.

2. Better instruments need to be devised, validated, and their reliability established to evaluate the study methods of elementary school children.

3. Study needs of elementary school pupils need to be identified, and further experimentation needs to be conducted to develop study programs to meet these needs.

4. A similar study should be conducted with social studies in the intermediate grades but with longer instruction sessions for at least one academic year.

A P P E N D I C E S

APPENDIX A

SQ3R Survey

Glance over the headings in the unit to see the few big points that will be developed. Read the final paragraph. This survey should not take more than a minute and will show the three to six core ideas around which the discussion will cluster. This orientation will help you organize the ideas as you read them later.

Question

Turn the first heading into a question. This will arouse your curiosity and thereby increase comprehension. It will bring to mind information already known, thus helping you to understand that section more quickly. The question also will make important points stand out at the same time that explanatory detail is recognized as such. Turning a heading into a question can be done at the instant of reading the heading, but it demands a conscious effort.

Read

Read to answer that question, i.e., to the end of the first headed section. This is not a passive plodding along each line but an active search for the answer.

Recite

After reading the first section, look away from the material and try briefly to recite the answer to your question. Use your own words and cite an example. If you can do this, you know what is in the material; if you cannot, glance over the section again. An excellent way to do this reciting from memory is to jot down brief cue phrases in outline form on a sheet of paper.

Now repeat the steps: question, read, and recite with each successive headed section. That is, turn the next heading into a question, read to answer that question, and recite the answer by jotting down cue phrases in your outline. Read in this way until the entire lesson is completed.

Review

When the lesson has been read through in this way, look over your notes to get a bird's-eye view of the points and their relationship and check your memory as to the content by reciting the major subpoints under each heading. This checking of memory can be done by covering up the notes and trying to recall the main points. Then expose each major point and try to recall the subpoints listed under it.

APPENDIX B

Lesson Procedure

1. Provide each student with the lesson material called for on the schedule for that day.

2. Direct the students to glance over the headings looking for major points to be developed.

3. Ask the students to read the final paragraph.

4. From the headings and the final paragraph, students will be adked to think of core ideas suggested.

5. Students will be told that the purpose of steps 2, 3, and 4 is to help them organize ideas when they read the material.

6. Now an effort will be made to arouse the curiosity of the students by asking them to turn the first heading into a question.

7. The students will now read the first headed section seeking an answer to the question raised in step 6.

8. After reading the section, the student will look away from the material and recite the answer found in step 7.

9. Now the answer will be substantiated by citing an example.

10. Cue phrases will be jotted down in outline form on a sheet of paper.

11. If the student experiences difficulty in completing steps 7, 8, 9, and 10, he will be asked to glance over the section again.

12. Steps 2-11 will now be repeated for each successive headed section until the lesson is completed.

13. After completing the reading, students will look over his notes for points and subpoints under each heading.

14. With notes covered, students will try to recall main points.

15. Students will look at main points in the notes and attempt to recall subpoints.

APPENDIX C

Lesson Review

Repeat steps 13, 14, and 15 from the lesson procedure in Appendix B.

APPENDIX D

THE OHIO STATE UNIVERSITY
COLLEGE OF SOCIAL AND BEHAVIORAL SCIENCES
1945 NORTH HIGH STREET
COLUMBUS, OHIO 43210

DEPARTMENT OF PSYCHOLOGY

April 27, 1972

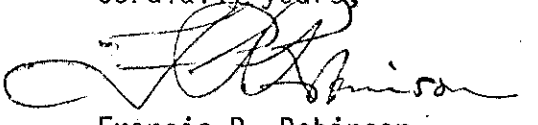
Mr. Gaston L. Walker
South Campus
Tarrant County Junior College District
5301 Campus Drive
Fort Worth, Texas 76119

Dear Mr. Walker:

At the time of doing the fourth edition of Effective Study (Harper and Row, 1970) I made a quite thorough survey of the research literature on study skills. I did find a few studies which had been done at the elementary school level; most of these are referred to in the early chapters of that book. I agree with you that the research on study skills at the elementary level is quite limited.

I also agree that study skills should be taught as soon as needed in the elementary school. By the way, Ernest Horn (Iowa) was promoting this idea even in the 1920's. It should be noted, however, that the kinds of study skills needed in elementary school, in high school and in college tend to differ, so some instruction should be given at each level on the new skills needed. However, early instruction in study skills is fully warranted. On completion of your dissertation and its publication, I would be interested in receiving a reprint of your study.

Cordially yours,



Francis P. Robinson
Professor Emeritus

FPR:ah

HURST-EULESS-BEDFORD INDEPENDENT SCHOOL DISTRICT

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OFFICE OF THE
SUPERINTENDENT

CHARLES W. WAGES
Superintendent of Schools

May 8, 1972

Mr. Gaston L. Walker, Coordinator
Programmed Learning Center
Tarrant County Junior College - South
5301 Campus Drive
Fort Worth, Texas 76119

Dear Mr. Walker:

This letter will serve as official authorization of the Hurst-Euless-Bedford School District for your project in our schools.

As per our agreement the principals of the school buildings involved in your study have been duly notified. I trust that you are able to pursue your studies with success and that our cooperation helps in a small manner in the project.

Respectfully,

Charles W. Wages

Charles W. Wages

CWW/cw

APPENDIX F

Chronology of the Study

	February 5, 1973	Met with the school principal and set a meeting with the teachers
	February 12, 1973	Met with the classroom teachers to discuss the project
	February 19, 1973	Met with the teachers to present SQ3R Study Method
	February 20, 1973	Discussed the pretest with the counselor and set February 28 as the test day
	February 26, 1973	First team meeting; planned unit on The Old South
	February 28, 1973	Pretests were administered by the counselor assisted by the investigator and the classroom teachers
E	March 1, 1973	Introduced the SQ3R Study Method to the experimental group
E	March 2, 1973	Experimental group was paced through a practice lesson with SQ3R
	March 5, 1973	Team meeting to plan a unit on The Oregon Country
C	March 6, 1973	Met the control group for the first time and discussed whether or not Texas should be considered a part of the Old South
C	March 7, 1973	Led the control group in discussing what life might be like in their city if Texas were still a part of Mexico and/or a Republic
E	March 8, 1973	Reviewed SQ3R and worked in class on a lesson applying SQ3R to a section of their assigned material entitled Mexican Texas

E	March 9, 1973	Reviewed SQ3R and completed the work begun on March 8, and assigned, as a part of The Old South, a lesson on Texas
	March 12, 1973	Planned a unit on movement into California
E	March 13, 1973	Discussed SQ3R and the assignment given on March 9
C	March 14, 1973	Met with the control group and read about What Life Was Like on the Oregon Trail
C	March 15, 1973	Provided the Control Group with a work sheet on the material read on March 14
E	March 16, 1973	Reviewed SQ3R and spent most of the period on Survey as it applies to SQ3R, and began working on Life on the Oregon Trail
	March 19, 1973	Team meeting to prepare unit on The Civil War
C	March 20, 1973	Did a map exercise with the control group identifying different trails to California
C	March 21, 1973	Read with the control group about California becoming a state in the United States
E	March 22, 1973	Reviewed SQ3R and completed the lesson begun on March 16. Introduced a lesson on the California Trails
E	March 23, 1973	Completed the lesson from March 22, 1973 and worked on developing a question as required by SQ3R, worked in class on the Survey and the Question
	March 26, 1973	Team meeting to discuss and plan for instruction dealing with slavery
C	March 27, 1973	Showed the control group a filmstrip on Texas and the Civil War
C	March 28, 1973	Discussed Texas and secession with the Control Group

E	March 29, 1973	Reviewed SQ3R and began the section on Texas and the Civil War
E	March 30, 1973	Completed the section on Texas and the Civil War with the experimental group and talked about RRR from SQ3R
	April 2, 1973	Discussed the date for administering the midtest in social studies and decided that it could be given on April 12
C	April 3, 1973	Brought reference material to class and talked about the role of the Indians in slavery and The Civil War
C	April 4, 1973	Presented information to the control group concerning military strategy of the North and the South during the Civil War
E	April 5, 1973	Reviewed SQ3R and began a practice lesson on Texas and Secession
E	April 6, 1973	Completed the work begun on April 5 and emphasized the importance of making a Survey before attempting to develop the Question
	April 9, 1973	Team meeting to develop material to teach the seige of Vicksburg
C	April 10, 1973	Met with the control group and discussed Texas and Secession
E	April 11, 1973	Reviewed SQ3R and took the entire experimental group, step by step, through the section in their assigned material entitled Turning Point of the War
	April 12, 1973	Experimental and Control groups took a midtest on social studies
	April 13, 1973	School dismissed one hour early for the spring vacation
	April 16-20, 1973	School dismissed for the spring vacation
	April 23, 1973	Team meeting to prepare unit on The Grasslands

C	April 24, 1973	Discussed, with the control group, the Turning Point of the War
C	April 25, 1973	The control group held an open discussion on the historical significance of the Civil War on our life today
E	April 26, 1973	Reviewed SQ3R and spent the period on The Civil War and Our Life Today
E	April 27, 1973	Used SQ3R to work on the material related to the Importance of Atlanta after 1863
	April 30, 1973	Team meeting to discuss date for post-test and check schedule to be sure both groups have equal time with the investigator
E	May 1, 1973	Reviewed the work done on April 27 and began a lesson on Wood Shortage on the Prairie, using SQ3R
C	May 2, 1973	Met with the control group and read about The Importance of Atlanta after 1863
C	May 3, 1973	Completed, with the control group, the work begun on May 2
E	May 4, 1973	Began an application os Sq3R to the section about Lon Leonard on the Prairie
C	May 8, 1973	Read to the control group about the advent of the windmill
C	May 9, 1973	Reviewed the windmills and read about plows for the grassland, with the control group
C	May 10, 1973	Read the section on Lon Leonard on the Prairie
C	May 11, 1973	Allowed free class time to have small group sessions on "What If We Had Lived In Lon Leonard's Time"
E	May 15, 1973	Completed the SQ3R lesson on Lon Leonard

E	May 16, 1973	Each student received a copy of Appendix A for future use. SQ3R was reviewed once more
	May 22, 1973	Posttests were administered by the counselor assisted by the investigator and the classroom teachers.

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