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ABSTRACT

A classroom field experiment was conducted on the effects of preparation homework and practice homework on student achievement in a fifth-grade social studies class, when used in conjunction with cooperative learning. The study investigated whether cooperative learning with or without preparation or practice homework produces greater student achievement, and whether student achievement levels were the same regardless of type of homework assigned. Subjects (N=64) were enrolled in four fifth-grade classes with teachers trained in cooperative learning. Two classes were assigned to a no-homework condition, one was placed in the practice homework condition, and the remaining class was in the preparation homework condition. A pretest/posttest was developed and administered to all students. Results suggest that the group of students doing cooperative learning, with the addition of homework, produced greater academic achievement than the group doing cooperative learning alone. No significant differences were found between the practice homework group and the preparation homework group. Appendices include reading assignments and cooperative learning activities, homework assignments, a copy of the test, and analysis of the raw data. (LL)

Homework and Cooperative Learning

A Classroom Field Experiment

Research Report 1990

Emporia State University
Faculty Research and Creativity Committee

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Harvey C. Foyle, Ph.D., Assistant Professor, Teacher Education, reviewed the research literature, acted as primary researcher, was a classroom observer, and directed the project.

Lawrence R. Lyman, Ph.D., Associate Professor, Office of Professional Education Services, reviewed the research literature, developed test items, and acted as a classroom observer.

Loren Tompkins, Ph.D., Associate Professor, Educational Administration, designed the field experiment and directed the statistical analysis of the collected data.

Sharon Perne, Graduate Assistant and a 1990 master's degree candidate, worked directly with the classroom teachers, assisted in the development of the Cooperative Learning lessons and homework assignments, collected data, and conducted the statistical analysis of the data.

Douglas Foyle, Project Research Assistant and a 1990 bachelor's degree candidate at Stanford University, assisted in researching the literature, assisted in typing, and assisted in the development of the Cooperative Learning lessons and the homework assignments.

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Harvey C. Foyle
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Abstract

Homework and Cooperative Learning
A Classroom Field Experiment

This paper reports the findings of a classroom field experiment on the effects of preparation and practice homework on student achievement in fifth-grade social studies when used in conjunction with Cooperative Learning, a classroom methodology.

Classroom field experiments that related to student homework generally found that homework increased student achievement. Also, classroom field experiments that related to Cooperative Learning found that Cooperative Learning increased student achievement. Proponents of Cooperative Learning as a classroom methodology indicated that it was a no-homework alternative to traditional teaching which included homework. Current research supports both contentions. No research has been located which connects Cooperative Learning and homework. No research has been located which supports the contention that Cooperative Learning with assigned homework produced even greater student achievement than Cooperative Learning alone.

A classroom field experiment was designed to investigate the following questions:

1. Will Cooperative Learning without homework produce greater student achievement than Cooperative Learning with homework?

2. Will Cooperative Learning with practice homework produce greater student achievement than Cooperative Learning with preparation homework?

3. Will Cooperative Learning with preparation homework produce greater student achievement than Cooperative Learning with practice homework?

4. Are the student achievement levels the same regardless of the type of homework assigned?

The study found that the group doing Cooperative Learning with the addition of homework produced greater student achievement than the group doing Cooperative Learning alone. There were no significant differences between the practice homework group and the preparation homework group.

Introduction

Homework and Cooperative Learning are two distinct educational approaches. Homework tends to be an additive to a classroom lesson; whereas, Cooperative Learning is a way of dealing with the classroom lesson itself. Hunter (1988, 1984) placed homework in the independent student practice category and Cooperative Learning in the guided student practice category. Homework can involve several types. For this classroom experiment, homework was defined as preparation homework (doing an assignment before the classroom lesson) and practice homework (doing an assignment after the classroom lesson). Thus, two distinct topics, homework and Cooperative Learning, are dealt with in this report.

Homework

The National Commission on Excellence in Education (1983) reported that the United States is "a nation at risk." In regard to the expectations of student homework, the Commission found that the amount of homework for high school seniors had decreased. At that time two-thirds of the seniors reported less than one hour of homework per night. In the findings regarding time, the Commission found that time spent in the classroom and on homework was often used ineffectively. The Commission determined that students in high school should be assigned far more homework than was then the case. Among its recommendations, the Commission called for more homework.

Research on the topic of homework has shifted with the passing of time and the interests of society. From the earliest popular press reports of 1913 until 1937, the homework debate centered upon the question of whether or not homework caused harmful effects on the psychological health of the student. A secondary aspect of the discussion centered on the possible disruption of family relationships. ("The first step...", 1913; DiNapoli, 1937) From 1937 to about 1978, the homework debate centered around whether homework or no-homework produced greater achievement by students. Although this controversy was pervasive prior to 1937, it became a topic of intense experimentation during the period. (Yeary, 1978)

With the rise of the 'Back-to-the-Basics' movement during the period 1974 to 1978, Yeary (1978) indicated that the emphasis shifted from an approach of homework versus no-homework to competencies and skills necessary for the completion of homework. Burron (1980) studied a hierarchy of purposes for reading assignments in secondary social studies. He found no basis for the proposed hierarchy. Clemmons (1981) investigated the identification of writing competencies of secondary students needed for science and social studies. Lee and Pruitt (1979) called for research using their taxonomy of homework. They

proposed that homework be divided into four types according to each type's purpose: preparation, practice, extension, and creativity.

Foyle (1985) conducted a classroom experiment involving two of Lee and Pruitt's categories: preparation homework and practice homework. The experiment placed students in three groups: no-homework, preparation homework, and practice homework. Foyle concluded that (a) factual content homework increased the students' achievement when compared to the students who were not assigned homework, (b) either preparation homework or practice homework can be assigned to students since both types of homework raised students' achievement when compared to the students who were not assigned homework, and (c) females and males achieved the same regardless of the type of homework assigned to them.

Thus, the homework discussion historically has dealt with the health of the student, homework versus no-homework, and components of homework assignments (Foyle & Bailey, 1988)

Cooperative Learning

Cooperative Learning has its roots in the methodology of small group learning. The most well-known Cooperative Learning researchers today are Robert Slavin, Johns Hopkins University, and David and Roger Johnson, University of Minnesota.

Classroom group research was conducted by Schmuck and Schmuck (1971). Group life in schools cannot be compared directly with group experiences in any other institution of our society. Although studies from industry, government, and the military have been helpful in generating insights and perspectives, there is no substitute for research done directly in public schools for understanding classroom group processes. Exploring the classroom as a group is a relatively new phenomenon among educational researchers. Schmuck & Schmuck (1971) indicated the following:

> Much current thinking and research have grown out of two separate but interrelated historical movements. One movement stems from the influences of John Dewey who emphasized social aspects of learning and the role of the school in training students for problem solving and for democratic, rational living.... The other historical movement grew out of Kurt Lewin's empirical research and the subsequent development of scholars and practitioners of group dynamics.... The Lewinean movement stressed the collection of scientific data which undergirded the philosophical work of Dewey and introduced the action techniques for improving group processes.

Since the 1970s, Cooperative Learning has been closely associated with the work of a variety of researchers and practitioners. David and Roger Johnson, University of Minnesota, research and promote a Cooperative Learning strategy called, Learning Together, which tends to have groups of 3 or 4 students working on a single task while emphasizing group processes that include mutual positive interdependence. (Johnson, Johnson, & Johnson-Holubec, 1984)

Robert Slavin, Johns Hopkins University, is associated with Student Team Learning. Within this category are a number of Cooperative Learning techniques. Student Teams-Achievement Divisions (STAD) involves students in groups of 4 working as a team to achieve higher scores on tests. The teams are given a group reward when the team increases its score. Teams-Games-Tournaments (TGT) was formulated by DeVries and Edwards and has been incorporated into Student Team Learning by Slavin. Instead of a test for teams to gain higher team scores, a tournament of three students is played. The material studied by the groups is converted into tournament questions. Competing members come from similar ability groups although each team is heterogeneous. Jigsaw was used by Aronson at the University of California at Santa Cruz. This technique has been adapted by Slavin and named Jigsaw II. It involves groups of students which are determined by the number of materials to be learned. The students become an expert on their material. Then these students meet in "expert" groups to discuss their knowledge. Upon returning to the original team, students share their new "expertness". (Slavin, 1990)

Sharan of the University of Tel Aviv has developed Group Investigations which is a highly defined research group approach. Each team has a topic that no other team has been assigned. Reports by teams present new materials to the other teams. (Sharan & Sharan, 1976)

Kagan of the University of California, Riverside, has developed several Cooperative Learning strategies that relate to the specific structures or content-free ways of organizing social interaction in the classroom. His approaches vary according to the structure of the student interaction which the teacher desires. Some of the Cooperative Learning strategies are Roundrobin, Co-op Co-op, Numbered Heads Together, and Partners. (Kagan, 1989/1990)

Think-Pair-Share developed by Frank Lyman of the University of Maryland involves two students who tutor each other after they have thought about the material alone. (Lyman, 1981)

William Glasser in the book, Control Theory in the Classroom (1986, p. 75) indicated that Cooperative Learning is a powerful classroom methodology. He stated: "What we need to do is to

move to classrooms in which students work together in small learning-teams. If we are willing to make this move, I believe we will have a good chance to succeed in motivating almost all students to work..."

Problem Area

Lee and Pruitt's taxonomy of homework is a fertile area of research. LaConte (1981) and Rickards (1982) called for research using that taxonomy. Foyle's (1985) homework experiment examined preparation and practice homework and found that traditional teaching using such homework increased student achievement over traditional teaching without any homework.

On the other hand, the use of Cooperative Learning, a classroom methodology, increased student achievement when compared to other methods of teaching such as the traditional approach. Most Cooperative Learning advocates imply that homework is unnecessary or at least minimized with the use of Cooperative Learning. No classroom experiment has been located that involves both homework and Cooperative Learning.

Thus, several questions are present. If Cooperative Learning raised student achievement and preparation and practice homework raised student achievement, then the following questions are indicated:

1. Will Cooperative Learning without homework produce greater student achievement than Cooperative Learning with homework?

2. Will Cooperative Learning with practice homework produce greater student achievement than Cooperative Learning with preparation homework?

3. Will Cooperative Learning with preparation homework produce greater student achievement than Cooperative Learning with practice homework?

4. Are the student achievement levels the same regardless of the type of homework assigned?

A null hypothesis was stated as follows: There is no significant difference in student achievement scores between students using Cooperative Learning and receiving no-homework and students using Cooperative Learning and receiving homework. Based upon previous research, the current researchers expected that a group using only Cooperative Learning would achieve at a lower rate than the groups that received either preparation or practice homework.

Significance of the Study

The objective of this study was to make a contribution to the literature of the field. Both homework and Cooperative Learning are strategies in which students practice needed skills. Homework is a form of independent practice (students working alone without the teacher's help outside of the classroom). Cooperative Learning is a form of guided practice (students working in the presence of the teacher and able to receive help from the teacher). Linking these two types of student practice would advance the current research literature.

The teachers of the public schools assigned homework regardless of contradictory findings prior to 1960. Teachers still assigned homework in a haphazard manner even with the clearer findings about homework assignments since 1960. The Cooperative Learning research since 1972 clearly indicated positive results upon achievement. This classroom field experiment attempted to determine whether Cooperative Learning in a fifth-grade social studies classroom when linked to preparation or practice homework produced greater student achievement than Cooperative Learning alone.

If preparation homework was found to produce more significant achievement results than practice homework, then the use of preparation homework, traditional in social studies, would be reinforced. If practice homework was found to produce greater student achievement, then teachers should alter their customary behavior of assigning homework before a class lesson in the light of the research findings. If a difference between the two types of homework was not found, then there would be no need to assign either preparation or practice homework alone. On the other hand, if Cooperative Learning without homework produced greater student achievement than Cooperative Learning with homework, then Cooperative Learning is really a "no-homework" methodology.

The long-range significance of this field experiment involved moving the homework research and the Cooperative Learning research bases beyond their present scope. This field experiment was an attempt to bring about a clarification and redefinition of homework using Lee and Pruitt's taxonomy and an attempt to determine whether Cooperative Learning was indeed a "no-homework" methodology.

Definition of Terms

Achievement - The adjusted group means of the teacher-made posttest (criterion variable) in terms of predicted gain using the covariates as control measures. (Popham & Sirotnik, 1973)

Analysis of Covariance (Anocova) - A statistical analysis which allows the researcher to statistically equate the treatment groups with respect to one or more independent variables that are related to the criterion variable. Even though students were not randomly assigned to the treatment groups, this procedure allows the researcher to study the performance of several intact groups which may not be equal. (Popham & Sirotnik, 1973)

Cooperative Learning - This is a specific form of small group methodology containing several strategies known as Cooperative Learning. Three class sections used Robert Slavin's Student Team Learning, Johns Hopkins University. The specific type of Student Team Learning was Student Teams-Achievement Divisions (STAD). One class section used Cooperative Learning in the form of the Johnson and Johnson Learning Together method. (Slavin, 1981)

Homework - The tasks assigned to students during the school day which are to be carried out at home. (LaConte, 1981) Homework was the taking of books and assignments home after school for the purpose of home study. (Crawford & Carmichael, 1937)

Intelligence - Cognitive ability of students as measured on the SRA subtest EAS. Using Unified School District #253's test scores from student cumulative files, this EAS score was used as a covariate.

Practice Homework - The most common and simple type of assignment given to help students master specific skills. It was limited to exercises covering material presented in class. (Lee & Pruitt, 1979) The goal was reinforcement of materials covered during the class activity or lesson. (LaConte, 1981) In relationship to a basic educational goal of acquiring basic knowledge, it was the "doing again after" the lesson was taught. The concept or skill was repeated for homework. (Foyle, 1989) The practice homework assignment was identical to the preparation homework assignment; however, it was given after the selected lesson.

Preparation Homework - Assignments given to prepare students to gain maximum benefit from subsequent lessons. (Lee & Pruitt, 1979) This assignment can be, but is not limited to, reading in preparation for the class lesson or activity. (LaConte, 1981) In relationship to a basic educational goal of acquiring basic knowledge, it was the "getting ready before" the lesson was taught. (Foyle, 1989) The preparation homework assignment was identical to the practice homework assignment; however, it was given before the selected lesson.

Review of the Literature

The following review of the literature is provided as background information for this classroom field experiment. Homework literature is divided into three categories: experimental research, such as dissertations and classroom experiments; empirical research, such as surveys of opinion; and viewpoint articles, such as a parent's feelings about helping a child with homework. Books often contain all three elements. The Cooperative Learning research has the same type of categories of information. For this report, experimental research will be reviewed.

Homework

Goldstein (1960) wrote one of the first reviews of the literature on the subject of homework. He noted that from 1929 to December 1958 Education Index listed 280 homework articles. Of these articles, 17 were experimental articles. None dealt with grades 1 to 4, seven dealt with grades 5 to 6, eight (including four of the previous seven) dealt with grades 7 to 9, and six dealt with grades 10 to 12. He concluded that the data of most experimental findings suggested that regularly assigned homework favored higher academic achievement. There were some indications that homework may be more important at some grade levels than at others, in some subjects than in others, or for some pupils than for others. This review led to further experimentation at the lower grade levels and in such specific areas as mathematics. (Maertens, 1968; Doane, 1973)

Hedges (1964) reviewed 40 of 292 articles published between 1954 and 1964. He found that there was no comprehensive and firm research evidence on the various facets of homework. He found that there was no definitive answer to such questions as the amount of time children of various ability and achievement levels should spend on homework or the nature of appropriate home study tasks.

Austin (1979) reviewed the literature from 1960 to 1977 for the subject area of mathematics. He found that the studies used different tests for the analysis. Different attitude measures and levels for achievement were used. Several of the studies were of the homework versus no-homework variety. (Gray & Allison, 1971; Maertens & Johnston, 1972)

Friesen (1979) did a review of the homework literature. He found that most of the research had been of the homework versus no-homework type. This was the situation especially prior to 1950. His conclusion was that the studies do not provide clear-cut endorsement for either the homework or the no-homework groups.

Foyle (1985) examined the homework experimental data base from 1892 through 1984. He noted that prior to 1960 experimental research was poorly designed, and methodologically and statistically questionable. After Goldstein's critique (1960) of experimental design, procedures, and statistical analyses, homework experiments were conducted in a more methodical and analytical fashion. Foyle & Bailey (1988) found that between 1904 and 1984, 84 homework experiments had been conducted. Prior to 1960, experimental research on homework was limited to 18 experiments. Homework was the dominant pattern for assignments during the period; yet, researchers continued to look for alternatives to homework. In the 1960s, there were 14 homework experiments. In the 1970s, there were 42 homework experiments. From 1980 through 1984, there were 9 homework experiments. In the school year 1983/1984, Foyle (1985) conducted a social studies homework experiment using Lee and Pruitt's homework taxonomy. Using a teacher-made test as a pretest and posttest. Foyle found a statistically significant difference in achievement scores between the homework group and the no-homework group in favor of the homework group. Homework raised student achievement when compared to no-homework. (Foyle & Bailey, 1988)

Homework experiments have varied in terms of the length of time that they were conducted. One high school experiment lasted for two weeks (Schain, 1954) and one grade school experiment lasted for the school year (Maertens, 1968). The length of homework experiments has varied from four weeks (Burron, 1980; Allison & Gray, 1970), six to seven weeks (Austin, 1976; Maertens & Johnston, 1972; Austin & Austin, 1974), and twelve to twenty weeks (Austin, 1980; McGill, 1950). The researchers in the current case chose to use the semester.

The amount and timing of homework assignments varied: one to two assignments per week (Maertens, 1968), three per week (Austin, 1980, Allison & Gray, 1970), four per week (Austin & Austin, 1974; Maertens & Johnston, 1972), and daily (Modlin, 1959). Bond and Smith (1966) surveyed 77 school districts and found that grades one to two had 20 minutes of homework, grade three had 25 minutes, grade four had 30 minutes, grade five had 40 minutes, and grade six had 50 minutes. The Pennsylvania Department of education (Study..., 1973) found that 33 schools had homework time policies. The time varied as a student progressed in school: grades one to three had from 0 to 30 minutes per night, grades four to six had 45 to 90 minutes, grades seven to nine had 90 to 120 minutes, and grades ten to twelve had 120 to 180 minutes. The National Education Association research series commented that students would become accustomed to the regularity and continuity of homework if it was smoothly graduated from a few minutes in the early grades to two hours in senior high school. (Strang, 1975)

Cooperative Learning

Watson & Johnson (1972) pointed out that the classic group experiment was that of Deutsch in 1949. Deutsch researched cooperation and competition and indicated that cooperative interdependence among students resulted in more satisfaction with classroom work and in better relationships among students.

Most older research studies indicated that cooperative student work was not inferior to traditional methods of teaching. Sharan & Sharan (1976) indicated the following:

> Small groups exert a positive influence on students' attitudes toward study, which is not cultivated in traditional classrooms....

The benefits of Cooperative Learning are numerous. The benefit most important to this classroom experiment is that of increased student academic achievement. Cooperative Learning has been studied for its effect on student academic achievement in more than 30 studies. In 82 percent of the studies, students working in Cooperative Learning programs achieved significantly better on the same objectives than did the control students who were taught by traditional methods. These positive effects were found in elementary and secondary schools in urban, suburban, and rural settings, as well as in diverse subject areas such as mathematics, social science, reading, and language arts. (Slavin, 1981) Students have also demonstrated increased retention of material learned and have demonstrated superior learning strategies in Cooperative Learning projects (Johnson & Johnson, 1978). Advantages of Cooperative Learning strategies when contrasted with competitive classrooms and totally individualized classrooms are most clearly seen when learning is assessed individually and the reward is given to the group on the basis of the group's performance (Featherstone, 1986).

Procedures

Participants

The professional staff involved in the study included Harvey Foyle, Assistant Professor in Teacher Education, Lawrence Lyman, Associate Professor in the Office of Professional Education Services, Loren Tompkins, Assistant Professor in Educational Administration, Sharon Perne, graduate assistant in Teacher Education, and Douglas Foyle, research assistant in Teacher Education.

The public school participants in this classroom field experiment were the students of Kim Kirk and Virginia Boettcher (William Allen White Elementary 5th grade) and the students of Mary Jo Dorathy and Charlotte Whitehurst (Logan Elementary 5th grade). The experimental sample started with 75 students and ended with 64 students divided into three groups. The students were those students who were enrolled during the fall semester of 1989.

Hypotheses

Null Hypothesis

There is no significant difference in student achievement scores between students using Cooperative Learning and receiving no-homework and students using Cooperative Learning and receiving homework.

Alternate Hypothesis

There is a significant difference in student achievement scores between students using Cooperative Learning and receiving no-homework and students using Cooperative Learning and receiving homework.

The experimental design allowed the researcher to compare preparation homework (Treatment #1) to practice homework (Treatment #2). In an analysis of covariance the original groups prior learning and intelligence were held constant against the outcomes by the group. Thus, the outcomes could be statistically different due to the treatments. The third group received no treatment and was used as a control group.

Scope and Limitations

The researchers were interested in only two types of homework: preparation and practice. Since the researchers were interested in the effects of homework only, it became crucial to keep the classroom presentations as similar as possible. In this case, the classroom presentations were covering social studies

using the Cooperative Learning methodology. Homework assignments were done outside the classroom so that the variable of supervised study or guided practice could be eliminated during the experiment.

Method

Subjects

The subjects were 64 fifth-grade students enrolled at two public schools in the Emporia School district. The students were enrolled in four different intact classes, with all four teachers having been trained in Cooperative Learning by the researchers. The classes were randomly assigned to one of three experimental conditions. Two classes were assigned to no-homework condition, one was placed in the practice homework condition, while the remaining class was in the preparation homework condition.

Instrumentation

The social studies materials provided by the school district were used. This material consists of the Holt Social Studies Series (Cangemi, 1983) and consisted of the textbook, Our History, and the supplemental workbook (Appendix A). The experimental group material also consisted of homework sheets containing four questions per assignment (Appendix B). A twenty-four item pretest and posttest was developed by the experimenter (Appendix C). This test consisted of items covered by the teacher during the course of the experiment, although the teachers were unaware of the pretest and posttest items. This "blind" procedure prevented teachers from teaching to the posttest items. These questions were also related to the homework questions which the both homework groups completed.

The Science Research Associates (SRA) tests were given by USD #253 at all elementary grade levels. The SRA subtest, the Educational Abilities Series (EAS), was a group intelligence test. The EAS was used as a covariate in order to hold constant the differences in cognitive ability between each student. EAS scores were collected from each student's school cumulative file as reported from the previous spring's testing.

Procedure

During August 1989, the researchers and the participating teachers determined classroom Cooperative Learning methodology lessons and homework assignments using the 5th grade social studies materials. Classes were randomly assigned to either the practice homework, preparation homework, or no-homework conditions. All groups covered the same material, and Cooperative Learning classroom lessons were employed in all

conditions. However, the practice homework group used Johnson and Johnson's Learning Together, while the preparation group used Slavin's Student Teams-Achievement Divisions (STAD), as did both no-homework groups. During the first week of classes, pretest scores were collected from all subjects. Those who were absent during the original testing session were tested the following day.

Following administration of the pretest, students began their typical social studies lessons, with all groups using Cooperative Learning techniques. In addition to regular classroom work, the experimental groups were also given approximately two homework assignments per week for the duration of the experimental phase, which lasted during the fall semester (approximately four months). Homework assignments covered approximately one-third of a chapter and correlated with questions on the pretest and posttest, as well as material covered by the teacher. Generally, homework assignments were regularly assigned, clearly stated, regularly collected, and promptly graded and returned (Foyle, 1989), with researchers recording the grades obtained by the subjects.

The experiment ran from September through January, and covered seven chapters of social studies material. Due to the fact that teachers varied in the rates at which they taught, the range of time between pretesting and posttesting varied from three months and three weeks to four months and three weeks for the four classrooms. All posttesting was done three days after the teacher had completed teaching the last unit of the seventh chapter.

Results

Pretest scores were collected from 75 fifth grade students. Student attrition occurred during the experimental phase due to students transferring out of the local elementary school district boundaries. These scores were eliminated from the sample. Students transferring into the district during the experiment were also excluded from the analysis. Thus, the final number of subjects was 64. Sample sizes for each cell were as follows:

Practice homework; $n = 15$

Preparatio homework; $n = 12$

No-homework; $n = 37$

The analysis of the data (Appendix D) consisted of the following: (a) the within subjects factor which was the multiple-choice posttest scores, (b) the between subjects factor of homework (practice homework, preparation homework, and no-homework), and (c) the covariates which were the multiple-choice pretest scores and the Educational Ability Series (EAS) test scores. An analysis of covariance was conducted using the statistical package SPSS/PC+.

In order to test the hypothesis that student achievement in the homework condition would be higher than student achievement in the no-homework condition, data were collapsed across the two homework groups and compared to the no-homework condition. Analysis of covariance results showed a highly significant effect for group, $F(1, 60) = 14.80$, $p<.0001$. Mean posttest scores of students in the homework condition were significantly higher than scores of students in the no-homework condition as shown in the Table 1.

Table 1

Cell counts, unadjusted means, and standard deviations of student posttest scores in homework and no-homework condition.

Homework Group	No-Homework Group
$n = 27$	$n = 37$
$M = 13.74$	$M = 10.43$
$S.D. = 2.57$	$S.D. = 4.76$

In order to test the hypotheses regarding differences in student achievement based on the type of homework, an analysis of covariance was performed using preparation homework and practice homework as between subjects factors. No significant differences were found between the two groups. Descriptive statistics appear in Table 2.

Table 2

Cell counts, unadjusted means, and standard deviations of student posttest scores in practice and preparation homework conditions.

Practice Homework	Preparation Homework
$n = 12$	$n = 15$
$M = 13.08$	$M = 14.27$
$S.D. = 2.47$	$S.D. = 2.60$

Discussion

The results of the current study bring to light some interesting implications for educators. The benefits of Cooperative Learning are numerous (Johnson & Johnson, 1978; Johnson et al., 1984; & Slavin, 1981). In addition, the benefits of homework have been shown (Foyle, 1989). The current study seems to indicate that the addition of homework to cooperative learning activities increases student achievement even more than either method does individually.

Several of the hypotheses which this study sought to investigate were substantiated. Specifically, it was found that Cooperative Learning with homework produced greater student achievement than Cooperative Learning without homework. Additionally, consistent with previous research (Foyle, 1985), no differences in student achievement were found between the practice and preparation homework groups.

The results of this study have several implications for educators. If results of this study are valid, then teachers should consider adding homework to their regular Cooperative Learning activities. Not only will students receive all the benefits provided by Cooperative Learning, but they will also show higher achievement gains.

Further research should be conducted to substantiate the results of this study, and to see if these positive results generalize to all subjects. Additionally, researchers could see if there is a substantial difference in the amount of information students retain in homework versus no-homework groups. However, the results of this study indicate that repeated exposure to material through homework will result in higher student achievement, a situation that teachers should keep in mind when developing lesson plans and student assignments.

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Appendix A

Social Studies Reading Assignments
and Related Cooperative Learning Activity

Textbook Reading Assignment	Cooperative Learning Activity
Chapter 2, Section 1	Workbook page 10
Skills Page 39	Workbook page 11
Chapter 2, Section 2	Workbook page 12
Chapter 2, Section 3	Workbook page 13
Skills Pages 50-51	Workbook page 14
Chapter 3, Sections 1 & 2	Workbook page 15
Skills Pages 66-67	Workbook page 16
Chapter 3, Section 3	Workbook page 17
Chapter 4, Section 1	Workbook page 18
Chapter 4, Section 2	Workbook page 19
Chapter 4, Section 3	Workbook page 20
Skills Page 91	Workbook page 21
Chapter 5, Sections 1 & 2	Workbook page 22
Chapter 6, Section 1	Workbook page 23
Skills Page 115	Workbook page 24
Chapter 6, Sections 2 & 3	Workbook page 25
Skills Page 123	Workbook page 26
Chapter 7, Section 1	Workbook page 27
Skills Pages 134-135	Workbook page 28
Chapter 7, Section 2	Workbook page 29
Chapter 7, Section 3	Workbook page 30

Appendix B

Name_____Date_____

Homework

Chapter 2 Section 1

Directions:
Review Chapter 2, Section 1, pp.35-38.
Write your responses to the following items.

1. What did Leif Ericson's settlement called? Where was it located?

2. Why did Europeans seek an all-water route to the East?

3. What contributions did Prince Henry make to sailing and navigation?

4. In what ways are today's astronauts similar to the early explorers? In what ways are they different?

Review Chapter 2, Section 1, pp.36-38. Write your responses to the following items.

1. What was Leif Ericson's settlement called? Where was it located?
2. Why did Europeans seek an all-water route to the East?
3. What contributions did Prince Henry make to sailing and navigation?
4. In what ways are today's astronauts similar to the early explorers? In what ways are they different?

Review Chapter 2, Section 2, pp. 40-45. Write your responses to the following items.

1. What did Magellan's voyage prove?
2. What voyages in this century have been as important as Magellan's?
3. How did the legend of Quetzalcoatl help Cortes?
4. Columbus found the island of Jamaica on which voyage?

Review Chapter 2, Section 3, pp. 47-49. Write your responses to the following items.

1. What parts of North America did John Cabot explore?
2. Why did the French want to find the Northwest Passage?
3. Why were Hudson's Voyages important tot the Dutch?
4. In spite of the fact that early explorers could not find the Northwest Passage, much was achieved by their voyages. List some achievements.

Review Chapter 3, Section 1, pp. 59-62. Write your responses to the following items.

1. What was the name of the first settlement built by Europeans in the United States.
2. Who explored Florida? What was he looking for?
3. What was Coronado really looking for when he explored the Grand Canyon?
4. Who was Father Serra?

Review Chapter 3, Section 2, pp. 63-65. Write your responses to the following items.

1. What was the main business of New France?
2. Why did Dutch settlers first come to the New World?
3. Why was it important for the first European settlements to be located near river?
4. What did voyageurs do?

Review Chapter 3, Section 3, pp. 68-74. Write your responses to the following items.

1. What was the Lost Colony?
2. Why did the Pilgrims come to the New World? What was their ship called?
3. How did Squanto help the Pilgrims?
4. Who founded Jamestown, the first permanent English settlement?

Review Chapter 4, Section 1, pp. 77-81. Write your responses to the following items.

1. Why did Roger WIlliams have to leave Massachusetts? Where did he go?
2. What is bartering? Give an example.
3. What products did New Englanders trade with the West Indies? What did they get in return?
4. How is your school different from a school in colonial New England? How are they alike?

Review Chapter 4, Section 2, pp. 82-86. Write your responses to the following items.

1. What colony did William Penn found? Why did he start it?
2. Why did Pennsylvania attract settlers?
3. List Benjamin Franklin's accomplishments.
4. How do you think Philadelphia's location on the Delaware River helped the city grow?

Review Chapter 4, Section 3, pp. 87-90. Write your responses to the following questions.

1. What is a cash crop? How were southern farms different from farms in the middle and New England colonies?
2. What is an indentured servant? How is an indentured servant different from a slave
3. Why did Lord Baltimore found Maryland?
4. What was the last of the 13 original colonies to be founded? Why did the settlers go there?

Review Chapter 5, section 1, pp. 99-102. Write your responses to the following questions.

1. What were the causes of the French and Indian War?
2. Why did some Indian tribes support the French?
3. What is a treaty? WHat treaty ended the French and Indian War?
4. Indian tribes fought with either the French or British because they shared a common interest. What are some common interests or problems today that the nations of the world are working to solve?

Review Chapter 5, Section 2, pp. 103-109. Write your responses to the following items.

1. Why is Samuel Adams important?
2. What did the Stamp Act do?
3. What happened at the Boston Massacre? Who is considered by many the first person killed for the cause of freedom in the colonies?
4. Why do you think the British were so angry when they heard about the Boston Tea Party?

Review Chapter 6, Section 1, pp. 111-114. Write your responses to the following items.

1. Who were the minutemen?
2. What did the Declaration of Independence do?
3. What was the result of the Battle of Bunker Hill?
4. Who said "Give me liberty or give me death?" What was meant by this phrase?

Review Chapter 6, Section 2, pp. 116-119. Write your responses to the following items.

1. Why was the American victory at Saratoga important?
2. What happened at Yorktown?
3. Who surrendered to Washington at Yorktown?
4. How can fighting a war on one's own territory be both helpful and harmful?

Review Chapter 6, Section 3, pp. 120-122. Write your responses to the following items.

1. How did women help in the Revolution?
2. Name two battles in which black soldiers played an important part.
3. How did the Marquis de Lafayette help the Americans?
4. During the American Revolution, Europeans came to help the colonists gain their independence. In what ways have Americans helped people in other countries?

Review Chapter 7, Section 1, pp. 125-135. Write your responses to the following items.

1. What compromise was reached at the Constitutional Convention?
2. A problem with the Articles of Confederation was that it did not give the national government enough power. What powers did the national government lack under the Articles of Confederation?
3. What function do the Bill of Rights perform?
4. Referring to the chart on page 135, what branch of government decides what the laws mean according to the Constitution?

Review Chapter 7, Section 2, pp. 136-138. Write your responses to the following items.

1. What if the President's Cabinet?
2. Name two famous Americans who served in Washington's Cabinet.
3. Who were the Federalists and the Democratic-Republicans? List the differences between them.
4. As you look at the United States today, has the Federalist of the Democratic-Republican idea of the future come true? Explain your answer.

Review Chapter 7, Section 3, pp. 140-143. Write your responses to the following items.

1. What were the causes of the War of 1812?
2. What did the War of 1812 demonstrate about the United States?
3. Why would warring nations want to attack each other's capital cities?
4. What incident inspired Francis Scott Key to write the national anthem of the United States, "The Star Spangled Banner?"

Appendix C

SOCIAL STUDIES TEST

_____1. Leif Ericson called his settlement in Canada

a. Jamestown
b. Trinidad
*c. Vinland
d. Nova Scotia

_____2. Columbus discovered which on these islands on his second voyage?

a. Portugal
*b. Jamaica
c. Trinidad
d. Cuba

_____3. Prince Henry of Portugal set up a school for sailors to help them

*a. find an all water route to the East
b. prepare for battle against Pirates
c. sail around the southern tip of Africa
d. engage in trade with the Vikings

_____4. The Aztec leader who thought Cortez was a God was

a. Magellan
*b. Montezuma
c. Tenochtitlan
d. Da Gama

_____5. The first Spanish settlement in Florida was

a. Santa Fe
*b. St. Augustine
c. San Diego
d. St. Lawrence

_____6. Father Serra traveled to California in order to

a. discover gold
*b. find a route to Canada
c. build missions
d. claim the area for Spain

_____7. Jamestown, the first English settlement, was started by the

a. Pilgrims
b. Massachusetts Bay Company
c. Quakers
*d. Virginia Company

_____8. The Pilgrims sailed to the New World on a ship called

a. the Santa Maria
*b. the Mayflower
c. the Pinta
d. the Samoset

_____9. Rhode Island was settled by

a. Miles Standish
b. William Penn
c. John Smith
*d. Roger Williams

_____10. A Quaker named William Penn was responsible for starting a settlement in

*a. the middle colonies
b. New England
c. the southern colonies
d. all of the above

_____11. Benjamin Franklin was the first man to establish a _____ in the colonies

a. police department
*b. fire department
c. college
d. hospital

_____12. The last of the 13 colonies to be settled was

a. North Carolina
*b. Georgia
c. Vermont
d. Florida

_____13. Crispus Attucks, who was killed during the Boston Massacre, was called

a. the father of our country
*b. the first man to die for the cause of freedom
c. a traitor
d. none of the above

_____14. One man who spoke and wrote about independence from Great Britain was

*a. Samuel Adams
b. Charles Townshend
c. Edward Braddock
d. William Pitt

_____15. Paper goods printed in the colonies were taxed by the

a. Sugar Act
b. Tea tax
*c. Stamp Act
d. Townshend Acts

_____16. The Treaty of Paris

a. ended the American Revolution
*b. ended the French and Indian War
c. repealed the Stamp Act
d. started the battle of Bunker Hill

_____17. Lafayette was a French officer who

*a. served on George Washington's staff
b. trained soldiers at Valley Forge
c. fought the Indians during the French Indian war
d. died at the Battle of Bunker Hill

_____18. The document listing the rights of the people and their complaints against Great Britain was

a. the Bill of Rights
b. the Constitution
*c. the Declaration of Independence
d. the Treaty of Paris

_____19. In a meeting in 1775, colonial leaders met to organize an Army and Navy to support colonial rights. At this meeting was Patrick Henry, who said

a. "Don't fire until you see the whites of their eyes."
*b. "Give me liberty, or give me death."
c. "I have not yet begun to fight."
d. "We hold these truths to be self-evident."

_____20. Lord Cornwallis surrendered to George Washington at

a. Valley Forge
*b. Yorktown
c. Saratoga
d. Bunker Hill

_____21. The Articles of Confederation's lack of power

a. is not important
*b. created problems for the new nation
c. led to the passage of the Northwest Ordinance
d. none of the above

_____22. The Bill of Rights

a. are no longer in effect
*b. protect the rights and freedoms of Americans
c. were written by Benjamin Franklin
d. are part of the executive branch

_____23. The Judicial Branch

a. enforces the laws
b. is elected by the state legislatures
*c. decides what the laws mean according to the Constitution
d. writes new laws

_____24. It was decided that each state could send two members to the Senate

a. at the signing of the Declaration of Independence
b. in the Northwest Ordinance
*c. at the Constitutional Convention
d. none of the above

Appendix D

Raw Data

1 = Preparation Homework
2 = Practice Homework
3 = No Homework

Subject Number	Group	EAS Score	Social Studies Pretest Score	Social Studies Posttest Scores
01	1	101	11	16
02	1	103	3	16
03	1	91	6	15
04	1	96	10	15
05	1	121	10	14
06	1	110	8	12
07	1	81	6	9
08	1	94	5	16
09	1	90	5	17
10	1	93	5	17
11	1	109	4	16
12	1	145	14	17
13	1	81	8	11
14	1	93	7	11
15	1	92	8	12
16	2	107	5	11
17	2	97	7	15
18	2	112	4	15
19	2	87	4	10
20	2	103	6	13
21	2	110	8	17
22	2	110	7	14
23	2	91	9	9
24	2	135	7	15
25	2	86	7	11
26	2	96	6	12
27	2	110	9	15
28	3	104	5	10
29	3	86	7	9
30	3	145	6	18
31	3	107	9	17
32	3	130	7	12
33	3	80	7	5
34	3	91	4	12
35	3	94	6	6
36	3	103	7	11
37	3	98	5	11
38	3	93	8	12
39	3	103	6	10
40	3	100	4	6
41	3	81	6	5
42	3	100	6	3
43	3	87	6	3
44	3	87	6	10

Subject Number	Group	EAS Score	Social Studies Pretest Score	Social Studies Posttest Score
45	3	123	7	10
46	3	109	9	12
47	3	86	7	9
48	3	96	5	10
49	3	127	5	14
50	3	107	9	16
51	3	113	11	9
52	3	88	9	2
53	3	107	7	17
54	3	112	9	19
55	3	86	9	8
56	3	94	7	6
57	3	114	8	19
58	3	90	3	6
59	3	81	8	9
60	3	106	5	7
61	3	107	5	19
62	3	106	8	17
63	3	90	7	9
64	3	86	5	8

* * * C E L L M E A N S * * *

SSPOST
BY GROUP

TOTAL POPULATION

13.74
(27)

GROUP

1	2
14.27	13.08
(15)	(12)

* * * A N A L Y S I S O F V A R I A N C E * * *

SSPOST
BY GROUP
WITH SSPRE
EAS

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	9.335	1	9.335	1.920	.179
GROUP	9.335	1	9.335	1.920	.179
Covariates	50.020	2	25.010	5.144	.014
SSPRE	6.766	1	6.766	1.392	.250
EAS	49.780	1	49.780	10.238	.004
Explained	59.356	3	19.785	4.069	.019
Residual	111.830	23	4.862		
Total	171.185	26	6.584		

64 Cases were processed.
37 Cases (57.8 PCT) were missing.

37

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

SSPOST
By GROUP
With SSPRE
EAS

Grand Mean = 13.741

Variable + Category	N	Unadjusted Dev'n	Unadjusted Eta	Adjusted for Independents Dev'n	Adjusted for Independents Beta	Adjusted for Independents + Covariates Dev'n	Adjusted for Independents + Covariates Beta
GROUP							
1	15	.53		.53		.77	
2	12	-.66		-.66		-.96	
			.23		.23		.34
Multiple R Squared					.055		.347
Multiple R					.234		.589

* * * C E L L M E A N S * * *

SSPOST
BY GROUP

TOTAL POPULATION

11.83
(64)

GROUP

1	2
13.74	10.43
(27)	(37)

* * * A N A L Y S I S O F V A R I A N C E * * *

SSPOST
BY GROUP
WITH SSPRE
EAS

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	170.843	1	170.843	14.801	.000
GROUP	170.843	1	170.843	14.801	.000
Covariates	293.718	2	146.859	12.723	.000
SSPRE	.170	1	.170	.015	.904
EAS	271.712	1	271.712	23.540	.000
Explained	464.561	3	154.854	13.416	.000
Residual	692.548	60	11.542		
Total	1157.109	63	18.367		

64 Cases were processed.
0 Cases (.0 PCT) were missing.

* * * M U L T I P L E C L A S S I F I C A T I O N A N A L Y S I S * * *

SSPOST
By GROUP
With SSPRE
EAS

Grand Mean = 11.828

Variable + Category	N	Unadjusted Dev'n	Eta	Adjusted for Independents Dev'n	Beta	Adjusted for Independents + Covariates Dev'n	Beta
GROUP							
1	27	1.91		1.91		1.81	
2	37	-1.40		-1.40		-1.32	
			.38		.38		.36
Multiple R Squared					.148		.401
Multiple R					.384		.634