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Achievement and social status in the cooperative classroom

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ACHIEVEMENT AND SOCIAL STATUS IN THE COOPERATIVE CLASSROOM.

by
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ABSTRACT

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Achievement and Social Status in the Cooperative Classroom
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The purpose of the study was to research whether student academic achievement and social acceptance of peers could be effected by cooperative learning instruction as opposed to a class where the students were not instructed using cooperative learning. The sample size of the experimental and control group was forty-six. The age of the group ranged from nine to eleven years of age. The sample was not randomly selected. Both classes were administered a pretest and posttest at the beginning of the study. The tests measured academic achievement and social acceptance. Both classes used the same textbook and supplementary materials. The main difference was the manner in which the students were grouped and instructed. The study lasted from the twenty-seventh of January to the thirteenth of April. At the conclusion of the research project the researcher administered a posttest. The posttests were the same tests used as the pretest.

The scores from both sets of tests were calculated and the results were graphed. The scores from the academic achievement tests were analyzed using the Analysis of Variance (ANOVA) and the t test. After the scores were analyzed the results revealed that there was no significant difference between the group that received the "treatment" and the class that did not receive that treatment. As for the students social acceptance of peers test, the scores of both the pretest and posttesst were subtracted. Then the entire class scores were averaged. The scores for both classes were compared and graphed. Again, there was no significant difference between the group scores.

The results of the tests did not support the hypothesis. There was not enough evidence to support the theory that cooperative learning instruction will increase student academic achievement and their social acceptance of one another. Perhaps if the researcher was not also the teacher there might have been a higher level of objectivity. This may or may not have effected the project. There was also a population within the sample that were not fourth grade level readers or in some cases third grade level readers. These students experienced difficulty when the tests were administered because they were not able to read the tests. Their scores were low, range (0-64), which contributed to the variance of the group. Possibly, future studies would allow supplementary assistance to groups that have this population.

MINI-ABSTRACT

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This research compared the instruction of one class using cooperative learning and one class not using cooperative learning. The researcher hypothesized that academic achievement as well as social acceptance of peers would increase in the class using cooperative learning. Two tests were administered in a test-retest situation and the sores were analyzed.

The scores were tabulated and graphed. None of the scores indicated a significant difference between the groups. Therefore, the hypothesis was not supported by the results.

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TABLE OF CONTENTS

LIST OF TABLES

Table Page

Chapter 1

Scope of the Study

Introduction

In this day and age it is crucial for our nation's elementary and secondary students to be aware of any recent technological advances. Students need to be fluent in technological skills. Most places of employment demand that their employees are able to use computers and possess higher level thinking skills. Employers are looking for potential workers with social skills that will enable them to work adequately with fellow employees. For example, a person can be completely qualified to hold a position of a computer programmer or a laboratory technician but if that person lacks social skills, their chances of obtaining the job are less then a potential employee who may be versed in both work and social skills (Kagan, 1989).

Many companies in the United States have spent thousands of dollars on training programs and workshops to retrain their employees to work cooperatively. However for the future generations of employees, this cooperation training needs to take place in the schools. Students need to be trained and prepared efficiently in the areas of mathematics, reading, writing, as well as the skills of working effectively with others. More and more students are coming into the classrooms from homes where there may not have been an environment of positive interactions among adults and children. For this reason students need to learn the skills of cooperation in the school. Students need to become knowledgeable in the area of cooperation. (Ellis & Whalen, 1990). With an increased use of fast food drive though restaurants, television video games, and parents working longer hours, are factors that contribute to young people spending less time communicating and cooperating with one another. Some people believe that schools must take on the responsibility of providing an environment where students can learn to communicate and cooperate with one another.

Cooperation can be taught in isolation and can be integrated into the other subject areas as well. (Ellis & Whalen, 1990).

Cooperative learning is a learning method that is being used in schools, teacher training programs, and in textbook company curriculum packages. (Slavin, 1989/1990). Some consider cooperative learning a new buzzword or a trend in education that may quickly fade away. However, cooperative learning is actually based on sound educational theories that have existed for the past two decades. These educational theories promote improved social interactions, group dynamics and academic achievement (Slavin, 1989/1990).

Statement of the Problem

In a competitive classroom, where competition prevails, it is common to find students who are not motivated to achieve. In the competitive classroom, the students that score the highest may only attempt to work at a level that will enable them to achieve that high score on future tests. The high scoring students may or may not avoid any extra challenges beyond what is required of them. The high scorers also may experience isolation or feel resentment and envy from their peers. On the other hand, average and low scoring students in the competitive classroom sometimes or consistently experience failure in the classroom. Constant failure can sometimes cause students to develop a false self-fulfilling prophecy. They believe they cannot succeed or achieve high scores and that only the high scorers receive the high grades. They may tend to label themselves as unintelligent or incompetent. This self-defeating, self-opinion affects their motivation to achieve in academics which can extend throughout the educational career of the student (Kagan, 1989).

Educators and researchers believe that competitive learning methods discourage academic achievement but encourages isolation and/or cliques among students. In this study the researcher will investigate both a cooperative and a competitive fourth grade classroom. The researcher will observe students in both environments to report the possible cooperative or competitive learning effect on student achievement and on the social acceptance of peers (Johnson & Johnson, 1989).

Statement of the Hypothesis

It was hypothesized that a class of fourth grade level students, who were involved in a cooperative learning program for science, would score significantly higher in areas of academic achievements then a class of fourth grade level students who were involved in a learning program for science. Achievement in science will be evaluated in a number of ways: standardized and nonstandardized test scores, comprehension of material, culminating projects, and independent practice assignments.

It is also hypothesized that the fourth grade level students in the cooperative learning program for science will have increased social acceptance skills be than the fourth grade students who did not have science through the cooperative learning program. Social acceptance will be measured by sociometric.

Definition of Terms

For the purpose of this study the following definitions were listed.

1.) social acceptance: A process that occurs as a result of frequent interaction and constant communication among the students in a positive fashion. A process that includes a great amount of talking, physical proximity, and group rewards for group efforts/completed projects. The successful outcomes of these processes may result in an individual fondness for one another.

2.) academic achievement: A successful completion of a scholastic goal in any particular field of study. For this study, achievement in science will be assessed by using standardized and non standardized tests, comprehension of material, culminating projects, and independent practice assignments.

3.) cooperative learning: A learning process in which small groups of students work together in order to accomplish a shared and preset goal. By working in groups the underlying purpose is that students will observe and internalize the concept of working together in order to achieve set goals. Helping one another, communicating, and

encouraging each other all contribute to a cooperative learning environment.

4.) competitive learning: A learning process that requires the students to work independently. The students must work without assistance from one another. The only way that the individual student has a chance of obtaining his/her goal is if a peer does not obtain his/her academic goal. The success of one student is often determined by the failure of another.

Chapter II

Review of Related Literature

Introduction

In the United States the status of our relations among people of different races, gender, religious, and class backgrounds is far from ideal let alone democratic or fair. Because a person is physically close to a person (in the neighborhood, workplace, or classroom) does not always guarantee that people will coexist peacefully. Rejection of others based on preconceived notions is rampant especially in our schools. Schools need to start removing the mantle of prejudice by constructing a Cooperative environment in the schools. It is crucial to the continuation of our democracy that as citizens we continue to behave in a manner that exudes our values on which our society is based. Those values being equity and respect among the diverse populations within our culture on a personal and group level. This respect for one another is taught at school as well as at home (Watson, Hildebrandt, & Solomon, 1988).

The purpose of this study was to evaluate if there was a positive effect on students opinions of one another as a result of cooperative learning. The researcher also investigated any possible effects that cooperative learning might have had on academic achievement by using the cooperative learning method with the students. The researcher used sociometric instruments to record and measure any increases in social acceptance that the students may have developed as a result of cooperative learning.

Cooperative Learning and Socialization

Research has shown that a Cooperative curriculum strongly influences improved social relations among races, gender, class, and physical ability level (Johnson & Johnson 1989, Ladestro 1991, Slavin 1987, Johnson, Johnson, Tiffany & Zaidman 1984, and Slavin 1989/1990). With this success in mind it is clear that cooperative learning should be used as an important tool in constructing positive relationships among students. Studies concerning

cooperative learning have been conducted over short and long time periods of time, lasting anywhere from four weeks to an academic school year. As a result of some of the studies social relations among students who previously were uninvolved with one another now have befriended each other or at least learned to tolerate each other in a better way then they did previous to the cooperative learning (Forbes & Ryba 1994, Ladestro 1991, Watson & Hidenbrand 1988, and Bartistich, Delucchi, & Solomon 1993). The reason for the improved social relations stems from a very old idea that humans need each other to succeed in a group. Success in the classroom is made easier when classmates help one another. Homogeneous grouping does not appear to encourage group success almost always one or more members become isolated from the group. Heterogeneous grouping will ensure that over time students will see their peers in a different light. Often we do not really know a person until we spend time with them, sharing and listening. cooperative learning sets the stage for positive interactions among students. Support and positive feedback are crucial components that the students will use in their interactions (Johnson&Johnson 1989).

In many instances instructors only label the components of successful socialization, respect, consideration, fairness, to name a few, but seldom do the students know how to achieve these qualities. What students need are concrete examples, opportunities to practice, honest evaluations, and time to reflect on problems or progress dealing with the newly acquires social skill(s) (Watson, Solomon, Dasho, Schwartz, & Kendzior). A classroom without this listed criterion is analogous to an art teacher showing her class a beautiful portrait of harmony and cooperation and then simply taking it away and instruction the students to draw the painting they just observed. No instructions, clues, or support. Many of our students today know what a cooperating classroom looks and sounds like but what many of them do not have are the skills to contribute to making their classroom a cooperative one, as well as some teachers.

It is crucial that students evaluate their work within the group both academically and

socially. Gradually the group members should associate their rewards, recognition, and positive feelings with the work of their group. Students also should be able to remember their positive feelings about group work so that when the they have to work in other cooperative groups they will have the hope for meeting with success in a group again (Johnson & Johnson 1989).

Cooperative Learning and Academic Achievement in Science

Research has concluded that sociable, helpful, and encouraging behaviors increases student achievement. In contrast the same research has also revealed that students who did not ask for or even refused assistance, scored negatively on achievement assessments. In Cooperative learning helpfulness is essential to achievement in any subject area. Students working with one another often are engaged in cooperative activities: repeating answers, reviewing, or quizzing one another. The chances of understanding and retaining the material is greatly increased in a cooperative setting then in a noncooperative setting where they would not be allowed or encouraged to work as closely together (Nattiv, 1994).

The number of research projects involving cooperative learning methods utilized in the science curriculums are on the rise. Particularly the effect of cooperative learning concerning academic achievement in science. Since 1977 the Johnson brothers have conducted and published forty-three major studies comparing the three major types of learning environments (cooperative, competitive, and independent). The brothers were looking for the amount of impact these three environments had on academic achievement. Out of the forty-three studies there were ten that were performed in a science classroom (Johnson & Johnson, 1989). In 1981, Johnson & Johnson performed a meta-analysis of one hundred and twenty-two studies that dealt with achievement across the curriculum, including science. Slavin discovered some worthwhile findings when he analyzed forty-six research projects dealing with achievement and noticed an eighty-four percent (84%) increase in student overall achievement (Kagan, 1992). Studies also provided some specific information on which types

of students experienced the largest amount of an achievement increase in science (Slavin 1987, 1988).

Minority students and female students were the student populations that felt the greatest amount of increase in their academic achievement (Kagan, 1992). The reason for this difference in achievement performance in cooperative classrooms may be that competition is not an essential ingredient to student success. Helping one another to succeed individually and as a group is essential. Findings indicate that the students in a traditional classroom who succeed are usually the students who are members of the majority culture. Generally in the majority culture students are indoctrinated to be competitive and to succeed independently. Cooperation and competitive learning are currently two of the three most widely used methods of instruction. The third type is known as individualistic learning. The students works entirely alone on assignments, projects, and strives to compete with his own personal best. A substantial amount of research and studies have proven that unlike individual and competitive learning when used correctly cooperative learning has yielded the most promising results in academic achievement in science for minority and female students (Johnson & Johnson, 1985). Some minority students and female students may have a cultural background that does not value competition or backgrounds that do not encourage competition, (Scott & Heller, 1991, Kagan, 1989). Some researchers believe that cooperative learning will solve the "achievement crisis" and close the gap between the majority and the minority (Kagan, 1989, Slavin, 1987).

In the realm of science many researchers have examined the possible relationships between cooperative learning strategies and academic achievement. Many researchers and teachers believe cooperative grouping may increase students interest in science studies, especially laboratory work. Some researchers hypothesize that an interest in science can turn into a motivation and eventually academic achievement (Robblee, 1991). In reference to laboratory work, typical laboratory classes already have students working in a group with as

many as five or as little as two partners. But the traditional grouping procedures for laboratory groups does not consider heterogeneous selection or group success. Science instructors and researchers are finding cooperative learning methods are more similar to adult science research groups found in the workplace (Small & Petrek, 1992). When students experience successful laboratory groups studies have indicated that a positive attitude develops as a result. Any worthwhile science program at the elementary level would provide laboratory as well as work for the students. (Okebukola, 1986). Cooperative lessons for science, as with all the other subjects, meet with the most success when the planned activity provides a task for each individual in the group to work on an assignment simultaneously. An activity where each student must wait for their turn or each member fills out a worksheet on their own, has proven to be counterproductive. Although there are times in the laboratory when students must take turns using the equipment, most cooperative lessons include provisions for that lull experienced by the other group members. The inclusion of all members in the group has been found to promote a positive effect on students and their opinion of science (Watson, Hildebrandt, & Solomon, 1988). Instructors are looking into the possibilities of cooperative learning in their science curriculum and some have already met with success using cooperative strategies. Continual low enrollment and poor achievement on standardized tests are one good reason why teachers, at all levels, need to give cooperative learning a chance (Okebukola, 1986, Davey, 1987).

Cooperative Learning, Peer Acceptance, and Sociometric Measures

Often when students have the chance to chose the peers they would like to work with in a group setting in more cases then one they will select their closest and dearest friends. Students tend to not choose to work with students that they dislike, or who are not familiar to them. Students that are reserved or intimidated by others are usually not complete participants in group activities. There are also students with personalities that try to dominate and control the dynamics of the group. Some students prefer to work solo on a project

because they do not have confidence that the other group members will be responsible for their portion of the assignment (Slavin, 1988). Cooperative learning strives to avoid these defeating situations by distributing the tasks and holding the students personally responsible. In a cooperative learning classroom the students have no choice but to work in the prearranged groups which were selected by the teacher. As a result of pre-planned social interactions, many students are able to perceive their peers in a more positive way. (Kagan, 1989, Watson, Solomon, Dasho, Schwartz, & Kendzior).

Utilizing a cooperative learning program is a successful method that can increase social support among students. When a student is in a classroom with either two or twenty-two other students in the classroom one way of determining if the social climate in the classroom is positive or negative is to evaluate whether the students accept one another. Students that do have a positive social climate, usually give as well as receive social support from one another. A class that demonstrates support, encouragement, and helpfulness the majority of the time, reveals evidence that there is a great deal of social support within the class. Cooperative learning can fortify a classroom that already possess a strong social support system. The opposite situation is a classroom of students that do not behave in a helpful or supportive way the majority of the time and to the majority of the students. There is also usually a significant amount of isolated students as well as a group of students that perpetuate the students isolation by purposely excluding them from activities, both of academic and social nature. cooperative learning would greatly benefit a classroom such as the one just described, where a social support system is lacking (Johnson and Johnson, 1985).

Adults that work with a group of children over a period of time, usually develop some idea of who are friends. They are also aware of the students who have few or no friends in the class. Countless studies have examined the correlation between self-esteem and academic motivation, achievement and success (McNergney & Haberman, 1989). One way that

instructors can determine if cooperative learning is effecting the social acceptance of peers is the utilization of sociometric measurement. Sociograms are commonly used by teachers to gain an objective perspective of the social relationships. The teacher administers a questionnaire for the students to reply to the inquires of who they like or dislike in the class. The teacher would then take this information and plot it on a diagram which would depict the social relationships that exist among the students (Anderson, 1985, Kagan, 1992). With the results that are depicted on the sociogram, the teacher who is using any cooperative learning strategies could use this valuable information to form cooperative groups and many already have used this as a determiner of groups. The teacher could give the exact same questionnaire as a post test. This would determine, if after a period of time, whether cooperative learning has changed the social dynamics of the student body. The results could be posted on a sociograms and any improvements could be visually depicted (Anderson, 1985).

Chapter III

Procedure and Design of the Study

Introduction

This study was designed to test a hypothesis that investigates cooperative learning and its possible effect in two specific realms. This particular study proposed that a cooperative learning instruction program in science improved academic achievement in that subject. The program was also designed to detect any improvement among the students social acceptance of one another within the classroom. In this chapter the sample of the study and the research design procedures are described.

Population and Sample

The location from which the population was selected was a city which was located in the southern part of the state. There were five districts within the city. This population was part of the third district. The district was a diverse ethnic population consisting of three main ethnic groups: African-Americans, Hispanics, and Caucasians. The income level is medium to low. Some people were employed in the city and others commuted. A large portion of the third district population received government funding for housing and living expenses.

The children in this population were between the ages of three and a half and twelve. They attended the school where this research project was conducted. The school was labeled a neighborhood school because eighty percent (80%) of the student population lived within walking distance to the school.

The sample selected from this population consisted of forty-six (46) from two (2) fourth grade level classrooms. The age range was from nine to eleven (9-11) years old. Out of the forty-six (46) children, twenty-one (21) of them were female and twenty-five (25) of them were males. Subjects used in the study were not randomly selected, the research was performed on an intact sample.

Research and Design Procedures

This study was initiated on the twenty-seventh of January and was completed on the thirteenth of April. Within the time frame both classes met for the science program approximately twenty-four (24) times. The Non-cooperative Class was not instructed using cooperative learning methods and the Cooperative Class did receive a cooperative learning instruction program. Both Non-cooperative and Cooperative studied the same subject and used the same materials. The subject was earth science which is in conjunction with district, state, and national standards. Non-cooperative and Cooperative Classes used the same textbook and supplementary learning material.

Before the onset of the study a permission letter was sent home to the parents of all forty-six (46) participants (see appendix A). Twelve (12) letters were returned. A second set of letters were distributed and seven (7) were returned. A third attempt was made to obtain the permission letters, the remaining twenty-seven (27) notices were collected at this time.

On the first day of the study the instructor explained to the children in both classes that they would be part of a research project. First, the researcher required the class to fill out a simple sociometric questionnaire (appendix B). Secondly, the students then completed a pretest assessment (appendix C). The students were informed that the tests would not be graded.

From that point on Non-cooperative and Cooperative Classes followed the same course outline as far as the subject matter was concerned. Both Non-cooperative and Cooperative used group work but the organization of both groups were arranged in a different manner. The students that worked in the Non-cooperative Class, formed a group with the students that were already seated in the surrounding three seats. There was no group selection on the part of the researcher. The students in the Cooperative Class, were arranged in groups as a result of selection based on their academic level in science and the results of the sociometric measures. The seven (7) cooperative groups were heterogeneous in all categories — gender,

academic level, social status, and ethnicity. Each group consisted of three(3) members.

During the last week of the study the students were administered posttests (appendices B & C). Both classes were introduced to both posttests in the same manner by the researcher.

Description Of Instruments

Sociometric measures can be an excellent way for teachers and other faculty to gain a more honest perspective on the relationships that exists among students. The results from any form of sociometric measures are commonly plotted on a graphic organizer in order to assist the interpreters of the information (Perkins, 1974). The graphic organizer usually depicts the relationships among the class as they objectively exist or they may show what the participants aspire their relationships to be, depending on the questionnaire purposes. The sociometric instrument (appendix B) that were used at the pretest and at the posttest of the study were developed by researchers Northway and Weld (1957), Norman Gronland (1959) and Thorndike and Hagen.

The sociometric pretest and posttest scoring strategy was used to determine if there was any change in the social acceptance of the students for their fellow class members as a result of cooperative learning instruction. For this study both fourth grade classes were given the sociometric pretest and posttest. The students had to list three students that they would like to work with the most, and three students with whom they would not like to work. The researcher tabulated for each student the amount of times that the student was selected for either category. The pretest and posttest scores for each student was averaged and the scores for the two pretests and the two posttests were plotted on a two by two (2 by 2) table of changed scores (table 1). The table was used to demonstrate whether there was any change in the social acceptance of peers as a result of cooperative learning instruction. If the Cooperative Class obtains a significantly higher score than the Non Coooperative Class, this would indicate that the increase is due to cooperative learning.

The academic pretest and posttest assessment instrument was utilized in order to measure achievement for both classes. The tests were taken from the textbook curriculum package (see appendix C). The assessments consisted of thirteen (13) multiple choice questions in related to the main ideas of the lessons found in chapters eight and nine.

The lesson plans that the researcher used were two different formats. The Non-cooperative class had lesson plans for their class completed in the Madeline Hunter style. Class The Cooperative class used lesson plan formats designed by both Johnson & Johnson (1991) and Incentive Publications (1992). (see appendices D & E). All three formats included the same academic goals but the cooperative lesson plans included areas of social skills instruction.

The Analysis of Variance (ANOVA) is an inferential statistic that is used to evaluate more then one group's posttest results and to determine whether the difference in scores (if any) was caused by the treatment or other chance occurrences. The ANOVA was used to statistically evaluate both groups. The t test for independent samples was also used in order for the researcher to decide whether the difference that was observed is significant or if it is merely due to chance.

Chapter IV

Analysis of Findings

Introduction

The purpose of this project was to determine if there was any effect on students achievement and social acceptance of peers as a result of cooperative learning instruction. The project involved two fourth grade classes. One class received the cooperative learning instruction and the other class did not receive cooperative learning instruction. The researcher administered both a pretest and a posttest. The results of the tests were analyzed for the purpose of indicating whether the researchers hypothesis was valid. Will a class that is receiving cooperative instruction improve academically? Will they be more socially accepting of their peers as opposed to a class that does not receive cooperative learning instruction?

The purpose of this chapter is to illustrate the data taken from both sets of pretests and posttest on the academic achievement assessment and the sociometric measurement instrument that were used.

Analysis of Data

The inferential statistics analysis for the scores obtained from the achievement pretest and posttest was performed by using MYSTAT V.2.1 computer software. MYSTAT is a subset of SYSTAT, which is one of the most commonly used statistical software packages. The actual inferential statistics that were used were the Analysis of Variance (ANOVA) and the t test for Independent samples.

The ANOVA was used to indicate if there was a significant difference between the two means from the pretests and posttest. The ANOVA identifies whether variance within the Cooperative Class is different from the Non-cooperative Class. If the Cooperative Class variance is larger than the error/chance variance then the researcher can conclude that the cooperative learning methods did improve academic achievement. On the other hand if there

is no great difference between the cooperative and Non-cooperative variance , then there is no significant difference. One would have to conclude that the hypothesis has been proven to be incorrect.

table 1

Academic Achievement in Science Test Results Tabulation

		Non-cooperative	Cooperative
Pretest	M	36.227	49.190
	S.D	15.988	18.007
Posttest	M	41.227	53.048
	S.D	25.584	15.055
		N:22	N:21

Table 1 displays the results of a 2 by 2 factorial analysis of variance that was conducted on the academic achievement in science by analyzing scores from pretests and posttest of all forty-three (43) students.

The mean overall score (for both pretest and posttest) for the cooperative group was 951. The mean overall score for the Non-cooperative group was 39. The effect for both the Non-cooperative and Cooperative group was significant (F-8.980, df=1.82, p<=.004). These results do not show a significant effect as a result of cooperative learning as indicated in figure 1:

figure 1

Non-cooperative and Cooperative Class Results Comparison Chart

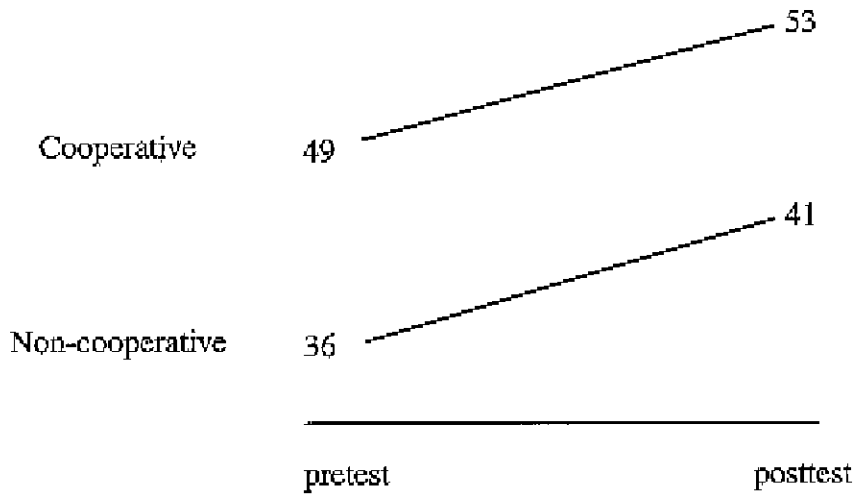


Figure 1 gives another graphical representation of how minimal the difference in variance was between the Non-cooperative and the Cooperative classes. The lines do not intersect at any point therefore there is no significant difference between the pretest and posttest scores as a result of treatment.

table 2

Analysis of Variance Summary Table

Source of Variation	Sum of Squares	df	Mean Square	F-ratio	P
Group	3299.670	1	3299.670	8.980	0.004
Condition	421.435	1	421.435	1.147	0.287
Group By Condition	7.017	1	7.017	0.019	0.890

The t test for independent samples was also applied to the raw data from both classes.

The t test is an inferential statistic that allows the researcher to look at two separate sets of scores from two different classes and determine whether there is a significant difference. A separate table that contains the values for t enables researchers to actually calculate and identify any significant difference. The formula for t tests for independent samples is as follows (Gay, 1992):

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

The n's represent the number of students in the Non-cooperative and Cooperative classes. The X_1 and X_2 represent the sample means and the SS is used in the same manner as the standard deviation, to indicate class variance. Both classes were assumed to be essentially the same when they both were the pretest but after both classes have been administered the posttest and after the treatment class had been exposed to the independent variable. The t test is used to indicate any significant difference as a result of treatment.

In this case the t test results clearly conclude on significant difference between the means as indicated in table 3:

table 3

Non-cooperative and Cooperative Groups Test Results from the t Test Tabulations

Pretest	M	42.558
	SD	18.003
Posttest	M	47.000
	SD	21.701
n=43		

Both the ANOVA and t test resulted in no significant difference between groups. Therefore, cooperative learning as indicated in the hypothesis does not improve academic achievement in science for the Cooperative class. The hypothesis could not be supported by the statistical evidence. The second portion of the hypothesis predicted that peer acceptance for the Cooperative class would improve as a result of cooperative learning. All of the forty-three (43) students were given the sociometric pretest and posttest. The students selected three students that they would want to work with the most and three students that they would want to work with the least. After the pretests and posttest were collected and the results were tallied. The researcher recorded a mark to indicate whether they were selected for either category if a student was not selected for either category. The researcher recorded a zero. The researcher then subtracted the marks of zeros from the pretest with the marks it zeros from the posttest. The students in Non-cooperative had their scores tabulated and averaged for both the least and most category. The marks or zeros for the students in the Cooperative class were also calculated. The results are posted on a two by two (2 by 2) table of changed scores:

table 5

Cooperative and Non-cooperative Group Changed Scores Results from Sociometric Pretests and Posttest

Not Chosen	0.5	0.3809
Chosen	0.4090	0.8095
	Non-cooperative	Cooperative

These results illustrated that there is a significant difference between the likelihood of being chosen in a cooperative class setting is greater that the likelihood of being chosen in a Non-cooperative setting. To be specific a student is almost five times more likely to be chosen in a cooperative learning classroom than not. As for the "not chosen" category the Cooperative class only experienced a one percent (1%) less of a chance of being selected. The results from the sociometric measure are not strong enough to support the portion of the hypothesis that predicted that cooperative learning would increase students social acceptance of one another.

Chapter V

Summary, Conclusion, and Recommendations

Introduction

This final chapter summarizes the problem, hypothesis, procedures, and findings. A conclusion and implication section is also included. The information for the conclusion and implication section was extracted from the Procedures and Findings section. Lastly, recommendations by the researcher are stated for any possible future research on the topic of cooperative learning.

Summary of the Problem

The problem researched in this study was whether or not cooperative learning could positively effect both academic achievement in science and social acceptance of peers.

Summary of the Hypothesis

The researcher hypothesized that cooperative learning would increase the performance of students on a standardized achievement test for science. It was also hypothesized that cooperative learning would improve social acceptance of peers among the students as opposed to a class not using cooperative learning.

Summary of the Procedures

The subjects used in this research consisted of forty-three (43) fourth grade students from an urban school located in southern New Jersey. Two fourth grade classes who were already preselected, studied the same material using the same resources, concerning the same subject, over a period of six weeks. However, one class was instructed and grouped using cooperative learning methods unlike the other class.

All forty-three (43) students were administered a pretest and posttest for academic

achievement. The tests consisted of thirteen multiple choice questions. The second portion of the research tested the social acceptance that the (43) students had for one another within their respective science class. Social acceptance was measured with a sociometric measure.

Summary of the Findings

The Analysis of Variance (ANOVA) and the t test were used to analyze any significant difference between the scores of the Non-cooperative and the cooperative classes. The findings from the analysis of scoring indicated that although the cooperative class received a fifty-three (53) on the posttest and the Non-cooperative class received a forty-one (41) . The difference between the two scores is not large enough to contribute to the cooperative learning treatment. The difference could be a result of other factors which are not indicated in this researchers hypothesis.

As for the other component of the research, measuring the amount of student acceptance within each classroom using a sociometric measure, no significant difference as discovered. Within the class using cooperative learning, there were more students accepted then unaccepted (0.8 who were chosen) in comparison to the other class where there were not as many students chosen (0.4 who were chosen). This difference is not significant enough to be contributed to the cooperative learning instruction, or in other words the treatment.

Conclusions, Implications, and Recommendations

In this study the hypothesis stated that cooperative learning could indeed effect academic achievement in science and could also improve social acceptance the students had for one another as opposed to the academic achievement and social acceptance of a class that was not using cooperative learning. Both achievement and social acceptance would be measured by using a standardized test and a sociometric questionnaire. The raw data from

the standardized test were analyzed by the Analysis of Variance and the t test. The sociometric raw data was averaged and graphed. In both sets of results it was concluded that the results did not support the hypothesis.

However, some informal information gathering done by the researcher indicated that some of the students were using some of the cooperative learning skills that they had been trained in previous to the research. During the research after every science class the students had to fill out a feedback sheet. They had to write down their feelings for the class as well as feelings about themselves as a class member. They could write about an area that needs improvement or an area that they met with some degree of success. Some of the feedback sheets contained questions and some were statements that they had to complete. Here are some of the responses:

I like working with a team because.. "It makes thing easier, faster, and funnier."

I enjoy working with ... "name"...because..."she is patient."

I felt I could have improved on... "behavior. because I was talking loud."

What can I do to help our class next time we meet? "I could of listened more better."

I like working with a team because..."it is easier to work then by working by my self."

How can we work better as a class? "say put up's only"

I like working with a team because.., "it is fun and I do not do my work by my self and In happy"

The scores received on the standardized test for achievement in both classes were negatively skewed such that most students received low scores, regardless of the cooperative learning. These results implicate that academic achievement and cooperative learning are not related. The results of the sociometric measure also indicate that there is no relation between cooperative learning and social acceptance of one another. The following recommendations are based on knowledge of this study:

1. The students that are enlisted in Special Education classes would be allowed to take the test with the Special Education teacher in order for her to read the questions to them. Seven (7) out of the forty-three (43) fourth graders receive scores ranging from zero (0) to forty-six (46). Six out of the seven special education students were unable to read a majority of the test. Six out of the seven special education students also perform at a reading level below fourth grade.
2. The time frame of the study be lengthened over a period of an entire school year. This would enable the students to have more practice with cooperative learning skills. It would also allow the students a chance to work in other groups and therefore have a greater exposure to the students in the class that they might not heave a chance to work with in a shorter research time frame such as this one.
3. The researcher should not be the teacher as well. The cooperative learning class had the researcher not only as science teacher, but as a homeroom teacher as well. It is possible that the students from the researchers homeroom might have been performing in a certain way as a result of their relationship with the researcher. Perhaps a more objective and removed researcher would yield different results.
4. The cooperative learning strategies that were used in this research involved rewards, (certificates, lunch with the teacher, homework passes, candy). Perhaps other cooperative learning strategies that do not include a reward system would effect the way in which the student worked in their class. Instead of using their skills in order to obtain an immediate reward a long term reward could be used.

Regardless of the results from this research there are volumes of research that has successfully supported the theory that cooperative learning does indeed positively influence academic achievement in all areas of study. Cooperative learning also effects students social acceptance and generally contributes to the social climate of the class. Future studies of cooperative learning need to continue to be executed by researchers trained in cooperative

learning instruction. Reasearch should be performed on groups that are able to read and understand whatever test or assessment means is being used at the time. Also, students should be properly trained in cooperative learning skills. There is still much need for cooperative learning in the classroom, thus continuing research will improve techniques and results.

Appendix A

Permission Letter

February 8, 1995

Dear Parent (s),

As you may already know, I have been working with your child in Mrs. Ingram's and Mrs. Vanamen's for social studies classrooms as the student teacher. This is my third week with the children and as they get to know me better, I am learning about their individual personalities as well.

Part of my teaching program at Rowan College is to develop and implement a research project involving the children. I would like to involve the entire fourth grade in my project. The project will involve cooperative learning strategies and their effects on the students social interaction as well as academic achievement. I will be looking for a difference, if any, between the two fourth grade classes. One class will have cooperative grouping and the other group will have regular grouping. I will work hard to make sure that both classes will be exciting and involve all the children, regardless of which class they are in.

The text, tests, and other learning materials that will be used during this project will be exactly the same in both groups. The major difference will be in my teaching approach. Your childs involvement is very important to me. Please let me know whether or not it I have your permission to include your student in the project. You may indicate on the lines below. If you have any questions or concerns, please do not hesitate to call me here at the school, 825-8300 in room 18.

Thank you for your time and consideration,

Natalie Cooper

☐ Yes, you have my permission to allow my child to participate in the project.

☐ No, I do not wish for my child to be involved in the project.

* If your child is allowed to participate in the project, his/her identity will remain anonymous. A made-up name will be used instead.

Appendix B

Sociometric Test

Peer Acceptance Sociometric Measurement

List three students from this class that you would enjoy working with the most:

1.

2.

3.

List three students from this class that you would want to work with the least:

1.

2.

3.

Please be honest with your answers. I will be the only one to see your answers.

Please include your name:_____

Appendix C

Achievement Test

Name _____ Date _____ Score _____

Chapter 8 Core Concepts

Fill in the circled letter for the one best answer.

Ⓐ Ⓑ Ⓒ Ⓓ **1.** How many planets have scientists found in our solar system?
(A) 3 (B) 6 (C) 9 (D) 12

Ⓐ Ⓑ Ⓒ Ⓓ **2.** Earth is the _____ planet from the sun.
(A) third (B) fourth (C) fifth (D) sixth

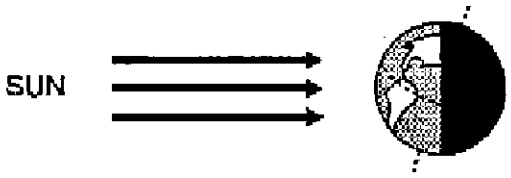
Ⓐ Ⓑ Ⓒ Ⓓ **3.** Which of these is closest to Earth?
(A) the sun (C) the moon
(B) Mars (D) Venus

Ⓐ Ⓑ Ⓒ Ⓓ **4.** How long does it take the earth to make one complete rotation?
(A) 24 hours (B) 12 hours (C) 1 month (D) 1 year

Ⓐ Ⓑ Ⓒ Ⓓ **5.** Which sentence about direct sun rays is true?
(A) They have more energy than indirect rays.
(B) They spread over a larger area on Earth than indirect rays.
(C) They strike the North Pole and South Pole all year.
(D) They fall straight on the surface of Earth.

Ⓐ Ⓑ Ⓒ Ⓓ **6.** How would you move to demonstrate Earth's rotation?
(A) jump up and down
(B) spin around in one spot
(C) walk around in big circles
(D) lean to one side

Use the drawing below to answer question 7.



Ⓐ Ⓑ Ⓒ Ⓓ **7.** In the drawing, it is winter on which part of Earth?
(A) south of the equator (C) at the equator
(B) at the South Pole (D) north of the equator

Name _____ Date _____ Score _____

Chapter 9 Core Concepts

Fill in the circled letter for the one best answer.

Ⓐ Ⓑ Ⓒ Ⓓ **1.** A natural solid substance that is found in the earth's crust is called a
(A) mineral. (B) schist. (C) dome. (D) crystal.

Ⓐ Ⓑ Ⓒ Ⓓ **2.** By which property are minerals grouped as metallic or nonmetallic?
(A) streak (B) luster (C) shape (D) color

Ⓐ Ⓑ Ⓒ Ⓓ **3.** A hard tile plate is used to test a mineral's
(A) streak. (B) softness. (C) age. (D) scratch.

Ⓐ Ⓑ Ⓒ Ⓓ **4.** The earth's crust is made mostly of
(A) iron. (B) nickel. (C) soil. (D) rocks.

Use the table below to answer question 5.

	Mineral			
	fluorite	apatite	feldspar	X
Hardness	4	5	6	

Ⓐ Ⓑ Ⓒ Ⓓ **5.** A student has pieces of the four minerals in the table. He wants to test the hardness of mineral X. The student tests mineral X with apatite and finds they do not scratch each other. What will the student find when he tests mineral X with fluorite and feldspar?
(A) Mineral X and feldspar do not scratch each other.
(B) Fluorite scratches mineral X.
(C) Feldspar scratches mineral X.
(D) Mineral X and fluorite do not scratch each other.

Ⓐ Ⓑ Ⓒ Ⓓ **6.** Scientists cannot be sure about what minerals make up the earth's core. Why is this true?
(A) The core contains unfamiliar minerals.
(B) The core is too deep to drill for mineral samples.
(C) The core's minerals change very often.
(D) The core is liquid, and the minerals cannot be separated.

Appendix D

Johnson & Johnson Lesson Plan Format

COOPERATIVE LESSON WORKSHEET

Grade Level: _____ Subject Area: _____

Step 1. Select a lesson: _____

Step 2. Make Decisions.

a. Group size: _____

b. Assignment to groups: _____

c. Room arrangement: _____

d. Materials needed for each group:

e. Assigning roles: _____

Step 3. Set the Lesson. State, in language your students understand:

a. Task: _____

b. Positive interdependence: _____

c. Individual accountability: _____

d. Criteria for success: _____

e. Specific behaviors expected: _____

Step 4. Monitor and Process

a. Evidence of expected behaviors (appropriate actions):

b. Observation form:

Observer(s):

c. Plans for processing (feedback):

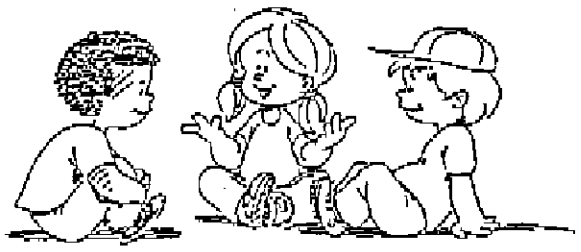
Step 5. Evaluate Outcomes

a. Task achievement:

b. Group functioning:

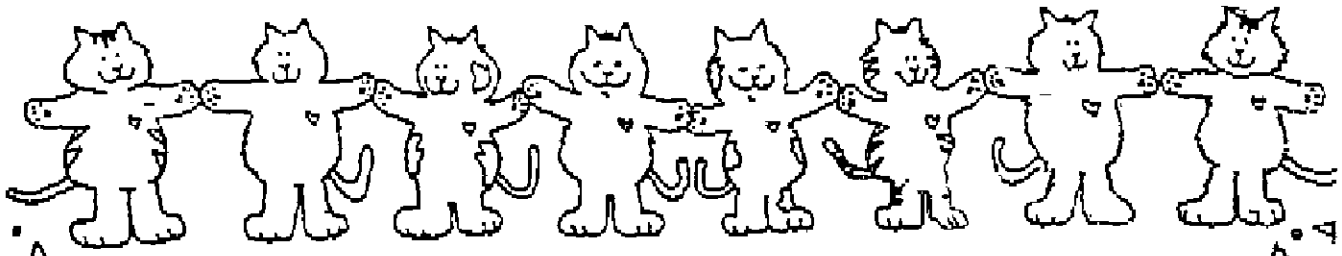
c. Notes on individuals:

d. Suggestions for next time:



Appendix E

Incentive Lesson Plan Format



Content Mini-Unit Outline

Title: _____

Purpose: _____

_____

_____

Materials Needed: _____

_____

_____

Suggested Group Size: _____

Suggested Group Roles: _____

_____

_____

Suggested Social Skills: _____

_____

_____

Learning Activity 1: _____

_____

_____

Learning Activity 2: _____

_____

_____

Learning Activity 3: _____

_____

_____

Learning Activity 4: _____

_____

_____

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