COOPERATIVE LEARNING TECHNIQUES AT THE GRADUATE LEVEL: USAGE AND ATTITUDES AMONG GRADUATE STUDENTS

By

SEFA BULUT

Bachelor of Psychology

Ankara University

Ankara, Turkey

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Thesis Approved:

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Dean of Graduate College

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

Statement of the Problem

Cooperative Learning Techniques at the Graduate Level: Usage and Attitudes Among Graduate Students

"Two are better than one, because they have a good reward for toll. For if they fall, one will lift up this fellow; but woe to him who is alone when he falls and has not another to lift him up... And though a man might prevail against one who is alone, two will withstand him. A threefold cord is not quickly broken". Ecclesiastics 4:9-12.

Educational researchers and teachers have emphasized the importance of cooperation among learners. It is widely acknowledged that cooperation is imperative among human beings. This constitutes the major element of human nature, family life, economic systems, and legal systems (Johnson & Johnson, 1989; Bean, 1992). As an educational technique, cooperative learning provides a vehicle to attain a sense of community. In human society progress is thought to depend on individuals and groups cooperating with each other. Therefore, cooperative learning has the potential to transform classrooms, schools, and ultimately society by creating communities of caring and support which, in turn, brings about high levels of achievement in many domains (Millis, 1998). Today, cooperative learning techniques have become well known and are being recommended as a solution for many different kinds of educational problems. Cooperative learning is

based on the social interdependence theories of Kurt Lewin, Albert Bandura and Morton Deutsch. However, some researchers trace the philosophical basis of cooperative learning to John Dewey's experimental learning and the role of the schools in preparing students for a life that requires democratic and cooperative attitudes.

Cooperative learning has been described and applied in a variety of forms (Wiederhold, 1991). Cooperative learning is defined by Slavin (1989) as a set of alternatives to traditional instructional systems, or more concretely, as techniques in which students work in heterogeneous groups of four to six members and earn recognition, rewards, and sometimes group approval based on the academic performance of the whole group. Cooperative learning is a structured, systematic instructional strategy in which students work together in small groups toward a common goal. Cooperative learning covers a broad territory, and there is wide variability in the amount of in-class or out-of-class time spent on group work. Cooperative learning activities typically involve classroom discussions intermingled with short lectures which can last an entire class period or a whole term.

Smith (1996) has elaborated on the issues of what is cooperative and what is not cooperative learning. He emphasized the fundamental elements of cooperative learning. According to him, cooperation is not basically having students sit next to each other at the same table to talk with one another as they do their individual class assignments. Nor is cooperation assigning a report to a whole group of students when one student does all the work while the others only put their names on the final report. Cooperation is not having students do a task individually and then having the ones who finish first help the slower ones. In fact, cooperation is much more than being physically near to other

students, discussing material with other classmates helping other students, or sharing material among students although each of these is important in cooperative learning.

Even researchers, such as Robert Slavin, David Johnson, Roger Johnson, and Spencer Kagan, postulate different approaches to cooperative leaning. But they all acknowledge positive results from it. All experts agree that cooperative techniques can positively affect student achievement, self esteem, attitudes toward academic discipline, time on task, and attendance (Millis, 1998). There are also differences in objectives and procedures of cooperative activities (Goodsell, Mahler, Tinto, Smith & McGregor 1992). Cooper, Cook, Smith, Mueck, & Cuseo (1990) contend that cooperative learning was developed for elementary and secondary education. But there is also considerable evidence that cooperative learning strategies are alternatives to traditional techniques at the college level. Furthermore, Cooper et al. (1990) argued that in colleges and universities across the U.S.A. as well as in some other countries, there are significant efforts to transform the classroom from lecture-based instruction to more active and stimulating cooperative techniques. This approach transcends disciplinary boundaries. Cooperative learning is a product of several decades of research and application and has accumulated a large body of literature. There is no single or right way to use cooperative learning. Nonetheless, some cooperative learning procedures are a combination of cooperative, competitive, and individualistic approaches while others are based on solely on cooperation (Johnson, Johnson, & Smith, 1991).

There are many concepts used in the literature about cooperative learning techniques, including student team learning, jigsaw I-II, STAD, group investigation, cooperative computer mediated learning, federated learning communities, freshmen interest groups,

collaborative learning groups, linked courses, and interdisciplinary seminars. What all these concepts have in common is their focus on active learning and cooperation between students and instructors.

In theory, method, and application, there are significant differences as well as overlap. Especially in the last decade, cooperative techniques have been extended and adapted to meet college classroom needs. Cooperative learning is employed by many educators and psychologists as a new instructional method because it has considerable effect on student's academic achievement, self-esteem, motivation, and attitude toward classes as well as on retention and class socialization (Johnson & Johnson, 1985). Working together in small groups promotes social involvement and integration among students. These social procedures have been found (Cooper et al., 1990) to be strongly associated with student retention rates. Likewise, cooperative learning promotes an approach that fosters acceptance and inclusion and also teaches effective communication, personal responsibility in decision-making, and promotes an internal locus of control (Abruscato, 1994; Johnson & Johnson, 1987). In a cooperative learning environment, students experience feelings of belonging, acceptance, support, and caring. The social skills and social roles required for maintaining interdependent relationships can also be taught and practiced through cooperation in all levels of education.

Cooperative learning has been advocated by the National Council of Teachers of Mathematics (1989, 1991) and by the National Research Council (1989). These reports primarily dealt with elementary and secondary education, but there are many studies in college and graduate level classes which suggest that cooperative learning can be an effective tool for post-secondary instruction. However, Kagan , Sharan, Lazarowitz,

Clark, and Shmuck (1985) disclosed that in his undergraduate classes at California State University, only 15 % of the students had worked on a cooperative learning project. Furthermore, he argued that most students somehow managed to go through the entire educational system without working with anyone. However, he believed that the economy and society would need people with more social skills in the future. Kagan was right. Nowadays industry is in the process of adopting cooperative models in many areas.

The potential value of cooperative learning in large college classrooms was identified by Johnson et al. (1991). Their study was designed to identify the specific factors that contribute to student's learning in large classes. Eight hundred college students were questioned about their learning sources. In their answers the second most frequently cited contributing factor to learning in large classes was other students. Johnson et al. (1991) also found that lecturing is currently the most common method of presenting information in colleges and universities. They argued that the instructional practice in college level education is oriented toward competitive and individualistic learning and that colleges are dominated by competitive and individualistic interaction structures. They reached the conclusion that there have been many attempts to change teaching techniques but that these attempts have not solved college instructional problems. Successful teaching may require radical changes to a new approach to instruction. Johnson et al. (1991) suggest cooperative learning. Cooper et al. (1990) stated that there is an over-reliance on the lecture method in higher education instruction. These long, uninterrupted teacher-centered methods lead to students playing passive roles in college classrooms. Consequently, Cooper et al. (1990) suggested that cooperative learning could enable all students to become more involved with course material and with each other. Involvement

brings about higher-level reasoning, critical thinking skills, learning how to learn, and problem-solving abilities. In the same fashion, some authors argued that cooperative learning is now finding prominence in college textbooks, at conferences, and in journals of higher education. Although these various approaches are known by different names, cooperative learning is occurring in every discipline at every level of education (Goodsell, Maher, Tinto, Smith & McGregor 1992). These authors argued that although over 1,000 studies have been conducted on cooperative learning at the precollegiate level, there are relatively few studies that have been done using college students; and the results are not consistent with those from elementary and junior/high schools.

Famous educational theorists, like Vygotsky and Piaget, argued about the social dimensions of the learning process. Only in recent decades have specially designed cooperative learning methods been regarded as an innovative, alternative technique to the lecture-centered approaches typical in most college classrooms. Most cooperative learning studies have focused on basic skills, but several have successfully taught such higher-order skills as creative writing, creative thinking, group research projects, or similar team projects. The application, evaluation, and synthesis of knowledge and other higher-level reasoning skills, however, were more frequently neglected or never realized as valuable educational purposes in college classrooms. Cooperative learning, on the other hand, promotes a greater use of higher-level reasoning strategies and critical thinking than competitive and individualistic instructional methods.

McKeachie (as cited in Johnson, Johnson, & Smith, 1991) reviewed college teaching methods and concluded that cooperative learning experienced students are more likely to acquire critical thinking skills and meta-cognitive skills, such as self-monitoring and

learning how-to-learn skills, from discussions with groupmates. Furthermore, students became more attentive and thoughtful than students who participated in lectures. Additionally, they revealed that many college faculty reported that they got to know their students better when they use cooperative learning groups. By observing student's work in small groups and then intervening seems to create more personal and informal interactions between the instructor and the students. Therefore, research must continue to test the limitations and promising opportunities of cooperative learning in order to expand our horizons and understanding of why and how cooperative learning would be effective in college and garduate school classrooms.

Statement of the Problem

Cooperative learning has been widely used in elementary and secondary education. There is also a considerable amount of research at the college and university level with regard to language arts, math, biology, and social science classes. However, there is little research which suggests that cooperative learning techniques are effective in graduate level classes. The purpose of this study is to investigate graduate level classes in both social and hard science and to ascertain student's attitudes, experiences, feelings, and behaviors toward cooperative learning activities. This research is an attempt to fill some gaps about how cooperative learning activities are being used by university professors of both social and hard sciences in graduate school. Lord (1994) and Slavin (1989) argued that classes are taught in most universities in a traditional way. However, recently there has been an effort to transform the college classroom from a lecture-based experience to a

more active form of cooperative learning (Matthew, 1994). Slavin (1989) also stated that cooperative learning methods are equally effective for all types of students. Cooperative learning theoretically can enhance student achievement at all grade levels and in all major areas in every school setting.

Objectives

Although cooperative learning has been employed in the elementary and secondary level school settings, at the college level very little research has been reported which would allow us to speculate that cooperative learning is used effectively at that level. Furthermore, no research has been located which deals with differences among graduate level students who are majoring in social or hard sciences. There is also little research which examines attitudes toward cooperative learning and teaching activities in graduate level classes. A potential benefit of this project could be the reassessment and restructuring of the traditional way of instruction for graduate level teaching. Therefore, our research hypotheses are as follows:

Ho 1: There will be no difference between social and hard sciences regarding the usage of cooperative learning in graduate classes.

Ho 2: There will be no difference between attitudes toward cooperative learning among graduate students in the hard and social sciences.

Ho 3: Attitudes toward cooperative learning can be measured reliably by a unidimentional scale.

Ho 4: There will be no differences between graduate student's attitudes and usage of cooperative learning.

In order to investigate these hypotheses, a short attitude toward and usage of survey concerning cooperative learning was developed and administered to graduate students and analysis made of their responses.

CHAPTHER II

REVIEW OF LITERATUTE

The following overview will provide a rationale, with examples, for cooperative learning techniques for undergraduate and graduate level classes. The focus of this research is to cover different kinds of cooperative learning activities that have been conducted by different researchers. Also, each example is from a different discipline, so each study shows that unique results are possible in different disciplines. These differences will be described below.

Cooperative learning, a structured form of small group learning, has became increasingly discussed as an exemplary pedagogy at the college and university level. It has also been used effectively across a wide range of content areas at different levels of education, including mathematics, reading, language arts, and social sciences.

In statistics classes, Jones (1991) compared students in traditional lecture-based classes and cooperative learning classes. He reported that cooperative learning techniques led to increased student-teacher interaction, class participation, office visits, attendance, and positive attitudes. Also, students experienced with cooperative learning expressed more positive feelings toward statistics than students in lecture based classes.

Later, Keeler & Steinhorst (1995) conducted a three-semester longitudinal project on cooperative learning, lecturing and individual-learning conditions in statistics. Keeler & Steinhorst (1995) taught a traditional lecture section with 76 students in the spring of 1990 and a cooperative learning class of 46 students in the fall of 1990 and then with another class of 40 students in 1991. This research took place in a rural institution,

the University of Idaho, in the northwestern part of the US. Classes took place Monday, Wednesday and Friday for 50 minutes each. The classroom materials and requirements were exactly the same throughout these three semesters. Students were required to write research papers, take two regular tests, and take a comprehensive final exam. In the cooperative learning section, students were allowed to cooperate on in-class activities and on homework; however, they were individually responsible for their papers, tests, and final exam. Students had the chance to form pairs by self-selection. After self-selection, groups of four students (quads) were formed by the instructor who preferred heterogeneous groups in terms of sex, ability levels, and areas of study. Every class session allowed 10 to 15 minutes for students to pose questions from the material being covered. Pairs were given three to five minutes to think, share their thoughts, and solve problems. Their response sheets were turned in at the end of the each class session. Quad groups were encouraged to assist each other on homework and to support each other's learning. They were expected to form study group sessions outside of class. Instructors offered group rewards in the form of bonuses. Each person was able to receive six bonus points. However, after completing the first cooperative learning session, the researchers decided not to use quads and not to use a point system in the subsequent semester. Concerning results, 30% of the students in the traditionally taught semester did not pass the course. While in the two cooperative learning sessions only 14% of the students did not pass the class. The median class averages were 71, 77, and 75, respectively, for the three subsequent semesters. In the traditional section 5% got a grade of A. On the other hand, in cooperative learning semesters, the rate of A grades were 11% and 20%. That is, in cooperative learning sections, a larger percentage of

students successfully complete the course and earned higher marks. Additionally, Keeler and Steinhorst (1995) administered questionnaire that revealed that students valued working pairs, wanted more time for group activities, and were satisfied with pair activities. As a consequence, more students successfully completed the cooperative learning classes; and these students obtained higher grades than did control group (lecture) students.

Further, Giraud (1997) designed a quasi-experimental study. His subjects were 459 educational psychology students who were enrolled in an introductory applied statistics course at the University of Nebraska at Lincoln. Giraud divided his subjects randomly into cooperative learning (experimental) and lecture (control) groups. Both groups were taught by the same instructor, used the same text, and worked the same sample problems and assignments. Both lecture and cooperative learning classes met twice a week for a 75 minute class period for one semester. At the start of this project, Giraud administered the Statistical Readiness Test. As the experiment went on, subjects took a second, third, and fourth test. In his statistical analysis, the cooperative group scored significantly higher than did the counterparts lecture group. Additionally, Giraud reported that students in the cooperative learning class asked questions more often, worked more closely together, and responded more positively to each other when they asked questions. Students seemed less hesitant about asking questions and giving explanations in small study groups. They had gained closer interaction as well as immediate feedback. His findings also suggested that cooperative learning promotes the retention of knowledge. His study also provides evidence that cooperative learning can be a valuable tool in hard science, college classrooms.

Felder (1996) conducted a five-semester longitudinal study between 1990 and 1994 with undergraduate chemical engineering students at North Carolina State University at Raleigh. He started teaching with cooperative learning techniques in the fall of 1990 with Chemical Process Principles (CHE2051) then followed with four more successive courses in chemistry of increasing difficulty. During the teaching activities, students were repeatedly administered surveys regarding their careers and their attitudes toward chemical engineering as a curriculum. In this survey Felder compared students from rural and small town backgrounds with students from urban and suburban backgrounds. He also evaluated gender differences in academic performance, attitudes, and self-concepts.

At the beginning of the course, he instructed the students to divide themselves into teams of three or four and stressed that when they get into business or industry they would have to work in teams. He also gave the rationale behind the instruction of cooperative learning activities. He demonstrated that cooperatively taught students tend to get better grades and enjoy classes more than students studying individually or competitively. Group members appointed particular people to be recorders, checkers, and coordinators. Then they rotated members through these positions for each assignment. If any problem kept occurring the group met with the instructor to get appropriate, conflict-resolution assistance. Consequently, problem-making students could become a friend or find another group to join.

In Felder's teaching orientation, a lot of emphasis was given to active learning experiences. These experiences focused on reducing the amount of lecture time, using extensive team-based cooperative learning both in and out of class, having students teach

one another, promoting and developing creative problem-solving, asking analytical questions, evaluating each other's work, and encouraging creative thinking. Students were also encouraged to engage in higher-level thinking skills, brainstorming activities in the school as well as at home homework assignments. At the end of the cooperative sessions individuals or pairs were given one-minute pop quizzes to check out if they comprehend the point. At the onset of cooperative instruction students were not willing to work in groups, but as time progressed they eventually become more positive and began to realized the benefits of cooperation. After six weeks of the first session students were reminded that if they wanted, they could do their work individually. Out of nearly 115 students, only three students preferred to do so. Two of these three were commuting students who stated that it is difficult to participate group sessions.

At the end of the semester, students were asked to evaluate the class. Over 92% stated that experimental classes were more instructive than their other chemical engineering courses and 8% percent rated classes as equally instructive. One student rated cooperative classes as less instructive. Felder revealed that in previous lecture courses, the grading distributions were almost bell-shaped; however, when the courses were taught cooperatively the grade distribution was remarkably skewed toward higher grades. About 92% rated group homework as helpful in contrast to 2% who rated it not helpful. Since the study was longitudinal, Felder was able to state that he observed a remarkable sense of community among students in their junior years. For example, they were partying together. In addition, he argued that the retention rate was considerably higher than in previous classes. Furthermore, his cooperative learning activities and student cooperation become famous among the surrounding industrial jobs. Therefore, this experience helped

to integrate the university and the job market together. Overall, the author compared his previous experiences with this study and concluded that in his cooperatively taught classes students performed at a higher level than in traditionally instructed chemical engineering classes. Felder concluded that the quality of learning and the intellectual growth of the students were considerably high.

In chemistry education, Dougherty (1997) designed a two-semester long cooperative learning environment. His aims were to increase the retention rate and to modify the learning environment by creating a supportive environment. His subjects were 200 undergraduate organic chemistry students. His experimental group contained 50% women and 20% minorities. He used a lecture format and cooperative learning strategies. Subjects were able to enhance communication by using e-mail, but they did not receive extra credit for e-mail interaction. Study groups were composed of four or five students. After each exam, students' grades were send to their electronic mail boxes. Results revealed that the retention rate was 0.76 for the experimental group which was 38% higher than the previous year. The instructor received 1,420 office visits and got 1,526 e-mail messages. Almost 30% of the messages were related to grades on forthcoming exam questions. His experiment showed that cooperative learning programs can increase the retention of students who participate in cooperative learning settings.

Deadly, Johnson, and Johnson (1997) investigated 50 undergraduate freshmen athletes' achievement in the Cooperative Learning Study Group Program (CESGP) developed for athletes in order to integrate them in to college life both academically and socially. The purpose was to establish a supportive, dependent study environment. Subjects were equally composed of male and female students from a variety of different

sport areas. In this study attendance was mandatory, and they had the chance to work alone each night. The CESGP was administered by two specialists and five tutors from different subject areas. During the evening study sessions, students took a study break at 8:45 until 9 p.m. Students were strongly encouraged to share ideas, notes, and insights, review each other's compositions and prepare for tests together. At the end of the quarter students were administered three instruments. The Classroom Life Measure was used to gather descriptive information with regard to student's interactions and perceptions about the study group. Deadly et al. (1997) did not have a control group, but descriptive results showed that students perceived the evening study groups as a cooperative enterprise. They did not see themselves as competitive or independent from each other; rather they considered the other participants to be friends and enjoyed studying together. In addition, they reported that they received academic and personal support from both the program administrative personnel and from peers.

Another form of cooperative learning, structured academic controversies, was used by Overby, Colon, Espinoza and Kinnunen (1996) in graduate level physical education classrooms. In this study 10 graduate students were divided in two groups, and each student was paired with someone in the other group. Each group was then given 20 minutes to prepare and argue a position. After that, they were allotted 10 minutes to share ideas, exchange information, or redefine their perspectives. Students were supposed to listen actively and critically, then ask factual information and subsequently change their position to the opposite point of view. Lastly, they presented their topics to the whole class. All of these class activities were very carefully structured. All class materials and presentations were completed within a three-hour class. Overby's results, based on his

observation and experiences, led him to conclude that structured controversy was very effective in developing high-level reasoning, critical thinking, the desire to exchange and take other's perspectives, and in-depth understanding.

However, Parker (1997) argued that although experts have advocated the use of cooperative learning for physical education, there is no research to support it. Therefore, she examined the effectiveness of cooperative learning strategies with one undergraduate and one graduate class in one semester at the University of North Dakota. Qualitative data were gathered from student journal entries, formal and informal interviews, student course evaluations, and professional journal entries. In Parker's analysis, students increased skills to learn on their own, learned more material, had more responsibility to the group, and perceived that the cooperative format was more work than the traditional instructional format. Also, from a teacher's point of view, students seemed to comprehend the content of the courses in more depth and with more shared understanding. The instructor also stated that her role changed to include teaching personal responsibility, social responsibility, and interpersonal relationship skills. Based on her results, Parker came to the conclusion that physical education teachers would do better with cooperative learning. Parker's results were consistent with earlier authors.

Parry (1990) investigated the effectiveness of assigned study groups in graduate level accounting courses, and interestingly and contrary to other research findings, Parry did not find positive benefits from cooperative learning. Contrary to Parry, however, Ravnenscrof, Buckless, McCombs & Zimmerman (1995) proved that Student Team Learning (STL) in undergraduate accounting education significantly improved student achievement in examination performance.

Again similarly, Kunkel & Shafer (1997) investigated the effectiveness of Student Team Learning (STL) in undergraduate sophomore auditing classes (business education) by using a bonus incentive system. Sixty-three students were assigned to a treatment group and 66 to a traditional control group. Then students were divided into groups of five with heterogeneous abilities. The same professor had taught and used the same syllabi, exams, and lecture content previously and were all identical in both groups. This research lasted one quarter. Students were administered tests at the beginning of the quarter and at midterm. They reported that there were no significant differences between treatment student team learning and traditionally taught sections in terms of grade point average. Furthermore, on exam and overall scores the traditionally taught group performed significantly better than the STL group. Kunkel & Shafer also administered a brief attitude survey, and students responded slightly more favorably in the STL. Kunkel & Shafer concluded that, in contrast to some previous studies, their study did not find a positive relationship between academic achievement and the use of team learning in business and accounting education. They concluded that cooperative learning teams may not be useful in all academic disciplines, and that more research is needed in domain.

Elbert-May, Brever, & Allerd (1997) were concerned about the instruction of large biology classes. In their study, they wanted all of their students to become biologically literate, which is defined as understanding the major biological concepts, being capable of using the process of inquiry to solve problems, communicating effectively, and developing positive attitudes toward biology classes, and developing self-confidence in understanding biology. Research was conducted at Northern Arizona University (NAU) and at the University of Montana (UM). Courses at both universities

attempted to personalize instruction, to incorporate cooperative learning, and to include student-centered, in-class experiences, stimulation and discussion. At NAU in the spring semester of 1995, 559 students enrolled in four lectures sessions of 140 each. Two faculty members taught one experimental cooperative group and one traditionally lecture-based group. Students were administered a self-efficacy instrument for their confidence in different aspects of biology. Also, all students were given a pretest, a posttest, and were required to take a national test to asses understanding of biological content. Data were analyzed by the Analysis of Covariance. Identical lecture notes were developed and employed by each instructor. Traditional lectures were instructor-centered, passive learning material, and individually oriented. In the experimental treatment condition, students were randomly assigned to groups of four students. In the cooperative groups students were allowed to change groups if they did not like their group or if their group was not productive. Also in cooperative learning sections, teams participated in writing and speaking activities, rotated roles, promoted one another's learning, shared the work, and felt responsible for their own learning. Students were asked to think about the possible answers to questions asked for half a minute and then bring their suggestions to group discussion for 3-5 minutes.

Results revealed that at NUS, cooperative learning students who participated in active learning, had significantly higher self-efficacy and higher level thinking, analyzing, applying, synthesizing, and processing skills than traditionally taught section. In addition, cooperative learning students scored higher on the National Association of Teachers. Elbert-May et al. concluded that in classes with large enrollments, allocating

time to cooperative learning activities did not harm student learning nor reduce the acquisition of knowledge.

Another study was conducted at the University of Montana (UM). Subjects were enrolled in introductory biology classes. Researchers personalized instruction, infused cooperative learning into the traditional lecture format, emphasized student-centered classroom stimulation and experiences, and promoted active learning through peer interaction during a one-semester class. Focused group interviews and written reactions from NAU and UM students disclosed that students learned better in cooperative learning and perceived the classroom environment to be more friendly, nonthreatining, fun, enjoyable, and dynamic. Likewise, qualitative evidence indicated that attendance was higher in the cooperative team group. Researchers argued convincingly that even in large-enrollment classes, students can still establish a cooperative group and instructors can be able to pay attention to all individuals by using group writing assignments. Follow-up studies are continuing in these universities with regard to persistence of knowledge and process skill.

In mathematics education, there has also been research on cooperative learning methods. Chang (1977), for example, used small group techniques with remedial students in arithmetic and algebra classes in a community college. In his experimental group students discussed mathematics in small groups composed of 3-4 people. In the control group the lecture-based approach was used. Tests in arithmetic, algebra, and a combined test were significantly higher in the treatment group than in the control group.

Later, Gilimer (1978) carried out a study with a developmental algebra course in a technical college. In the experimental classes small group discussion were used; and in

the control classes an individual self-pacing approach was used. Surprisingly, there were no significant differences in achievement or intellectual development. However, the treatment group had significantly more positive attitudes and interest in the course. Additionally, the treatment group had a lower withdrawal rate than the control group class, but pacing was faster in the control group. Again in a similar study, Davidson (1985) explained that different types of cooperative learning techniques have been used in teaching many mathematics courses, ranging from elementary through graduate school since the 1960s.

Cooperative learning techniques have also been used in literature and writing classes. A cooperative writing study has been reported by O'Donnell, Dansereau, Rocklin, Lambiotte, Hythecker & Larson (1985). In this study, they tested the cooperative learning techniques in writing skills enhancement classes. They proposed that writing skills would be improved by these methods that have been effective in science classes. This experiment was designed to explore the potential of improving writing ability through cooperative dyads. They had three objectives in their study. First was to compare the performances of college students who completed the assignments in groups with those who completed the assignments alone. Second was to assess the effects of transference from cooperative experiences to an individual writing task. Last was to identify what aspects of writing were influenced by cooperative learning participation. In order to carry out this study, 36 students were recruited from introductory psychology classes at Texas Christian University. Students were awarded with course credit for their participation for this experiment. The Delta Reading Vocabulary Test, and the Group Embedded Figures Test were administered and used as

covariates in subsequent analyses. The Delta, a 46-item multiple test, was used as a measure of verbal capacity. The experiment was completed in two sessions of approximately 2 hours each. During the first session all the students were administered the Delta Reading Vocabulary Test. After that, the participants were randomly assigned to the cooperative condition or to the individualistic section. Students in the cooperative condition were randomly assigned to same-sex dyads. The dyads were asked to cooperate in producing a set of instructions for writing a description. They had 50 minutes to finish the task. During the second session, which occurred the following day, each of the participants, working alone, wrote a second set of instructions. Again, the participants had 50 minutes to complete the task. For evaluation, each set of instructions was scored for the presence or absence of the set of required instructions, and the scores were summed to form an overall communicativeness score. Results showed that correlations between rates ranged from .73 to .98. The dyads outperformed the individuals on both tasks. O'Donnell and et al. concluded that the students who worked in cooperative dyads wrote instructions that were more communicative than students working alone. Furthermore, students who participated in the cooperative situation subsequently engaged in cooperative activities when writing alone. This study indicated that cooperative dyads as learning conditions can improve the communicative quality of writing.

Adult learners can also benefit from cooperative learning techniques. According to Cottel and Millis (1994), once adult learners understand the purposes, structure, and consequences of cooperative learning, they will be willing to cooperate.

Another cooperative learning experiment was used to investigate the implications for minority classrooms. Frierson (1986) revealed that Black nursing students studying

cooperatively obtained higher scores on state nursing exams than did an individually oriented control group. In the same way, Treisman (1985) conducted a cooperatively taught workshop with Black math and science students at the University of California at Berkeley. The experimental group's grade point average was 2.6 versus the control group's average of 1.5. Likewise, the retention rate was 65% for the cooperative group but only 41% for the control group.

George (1994) tested the effectiveness of cooperative techniques in a multicultural university classroom. The purpose of this study was to compare cooperative learning with traditional teaching methods. Sixty-one undergraduate educational psychology students participated in cooperative and traditional teaching techniques during an 18-week period of time. Subjects in the cooperative treatment condition included 22 African-Americans, 1 Bahamian, and 7 European-American. In the traditional control condition subjects were 22 African-Americans, 1 Chinese, and 8 European-Americans. These classes did not differ very much in terms of ethnicity, gender, age, and grade point average. The two classes received the same instructional material taught by the same professors.

In the experimental group, the instructor employed drill and review dyads, cooperative response techniques, and group grading incentives as instructional tools. Students were randomly and permanently assigned to learning partners for the 18-week period. Students were given structured assignments and some allotted time during each class period for drilling and reviewing each other's assignments. One partner was a recorder, the other a listener, and the roles were rotated for every assignment. Each partner reviewed and double-checked the responses of the other's explanations of the activities

they had engaged in. However, the control group used traditional, competitive strategies. In this study the dependent variables were achievement and attitude toward the effectiveness of instruction. Achievement was measured with a combination of exams and weekly quiz grades. Attitude was measured with the university's evaluation forms. The t-test results indicated that the cooperative leaning treatment group out-performed the noncooperative group. Secondly, the analysis of differences in attitude toward effectiveness of instruction found that the use of cooperative learning methods promoted more favorable attitudes toward classroom instruction. The cooperative group rated the instruction more favorably than did the traditionally taught group. In George's conclusion, she stated that the use of cooperative leaning techniques, especially in multicultural college classrooms, improved student's academic achievement as well as attitude toward instruction. Furthermore, cooperative leaning experienced students made higher grades than their counterparts in traditional groups even after the cooperative teaching was finished.

Walker (1996) used student learning teams for an effective way to reach the goals of feminist teaching with an upper-division undergraduate course on gender and family relationships. There were 36 undergraduate students, two of whom were seniors with the rest being juniors. She used a student-team learning approach in order to meet the goals of feminist pedagogy during a 10-week period. Class sessions were held twice weekly for 80 minutes each. On the first day of class students were informed that their primary assignment would be a research paper which would be based on interviews with married couples regarding joint TV watching leisure activities, remote control behavior, and other topics. Students were told that research often involves collaboration and that work must

be done together. In order to get high quality research reports, they had to work together as a class and in small groups. Students were taught techniques and tips regarding interviews, literature reviews, and reports and warned against any kind of expected possible frustration that they may experience during their study. Then students were divided into 9 groups of 4 students each by their own selection. They were allowed to work together with their close friends. Walker employed several techniques to optimize student involvement such as encouraging students to join group activiies, frequently giving surveys to see where students were in their work, and inviting students to comment on the effectiveness of this process. Positive interdependence, face-to-face interaction among group members meeting during class time, giving each other feedback, and challenging each other's conclusions was encouraged. In each group, students shared the labor for literature searches. They discussed differences between articles from popular media and from professional journals. Students were allowed to choose the topics they covered in their interviews. Each student interviewed one couple; so each group interviewed four couples. All students submitted a separate research paper and an audio-tape along with their transcripts of the interview. Additionally, they were required to read three books and take a midterm and a final exam. In her argument, Walker revealed that the quality of data, level of understanding about research, attendance, attentiveness, and student's motivation were higher than in past years when cooperative education was not used.

Statement of the Problem

Cooperative learning has been widely used in elementary and secondary education. There is also a considerable amount of research at the college and university level with regard to language arts, math, biology, and social science classes. However, there is little research which suggests that cooperative learning techniques are effective in graduate level classes. The purpose of this study is to investigate graduate level classes in both social and hard science and to ascertain student's attitudes, experiences, feelings, and behaviors toward cooperative learning activities. This research is an attempt to fill some gaps about how cooperative learning activities are being used by university professors of both social and hard sciences in graduate school. Lord (1994) and Slavin (1989) argued that classes are taught in most universities in a traditional way. However, recently there has been an effort to transform the college classroom from a lecture-based experience to a more active form of cooperative learning (Matthew, 1994). Slavin (1989) also stated that cooperative learning methods are equally effective for all types of students. Cooperative learning theoretically can enhance student achievement at all grade levels and in all major areas in every school setting.

Statement of Hypotheses

Although cooperative learning has been employed in the elementary and secondary level school settings, at the college level very little research has been reported which would allow us to speculate that cooperative learning is used effectively at that level. Furthermore, no research has been located which deals with differences among graduate level students who are majoring in social or hard sciences. There is also little research which examines attitudes toward cooperative learning and teaching activities in graduate

level classes. A potential benefit of this project could be the reassessment and restructuring of the traditional way of instruction for graduate level teaching. Therefore, our research hypotheses are as follows:

Ho 1: There will be no difference between social and hard sciences regarding the usage of cooperative learning in graduate classes.

Ho 2: There will be no difference between attitudes toward cooperative learning among graduate students in the hard and social sciences.

Ho 3: Attitudes toward cooperative learning can be measured reliably by a unidimentional scale.

Ho 4: There will be no differences between graduate student's attitudes and usage of cooperative learning.

In order to investigate these hypotheses, a short attitude toward and usage of survey concerning cooperative learning was developed and will be administered to graduate students and analysis made of their responses.

CHAPTER I I I

METHODOLOGY

The Population

In this study, the researcher sought to gain a greater understanding of the manifestation of attitudes and usage of cooperative learning in graduate level classes. All participants were volunteers. Participants for this study were selected from the total population of 3,000 graduate students enrolled in Oklahoma State University in Stillwater, Oklahoma, (population 40,000) in the spring of 1998. It is expected that the majority of the subjects will be middle or working class, aged 23 or older, and white with equal numbers of males and females. A few minority--primarily Hispanic and African-American--and international students were included. In addition, subjects were predominantly from urban areas or small towns within Oklahoma and the surrounding states. A random sample of graduate students were selected and administered a usage and attitudes questionnaires.

Graduate students have been chosen for two reasons. Firstly, there are very few studies at the graduate level dealing with cooperative learning. Secondly, unlike in high school and undergraduate school, graduate students are subjected to different instructional techniques that focus on group projects, presentations, and research papers.

Demographic Information:

Table # 1 Social Science Subjects N=75

Educational Level		Gender		Teaching Position		Age			
Master	Doctorate	Male	Female	Teaching	Not - Teaching	20-24	25-29	30-40	40 and Above
45	30	61	14	13	62	16	36	19	4

Table # 2 Hard Science Subjects N=75

Education Level		Gender		Teaching Position		Age			
Master	Doctorate	Male	Female	Teaching	Not Teaching	20-24	25-29	30-40	40 and Above
47	28	39	36	12	63	13	37	20	5

The Sampling Frame

The sample was defined as graduate students currently enrolled in graduate school in Oklahoma State University. The sample was seek to obtain data from 150 graduate students. The population consisted of students from all colleges and departments. Social science disciplines represented by the population including Education, Counseling, Journalism, Geography, History. Hard science students were from Mathematics, Physics, Chemistry, Animal Science, Computer Science, and Engineering departments.

The sample contained equal number of graduate students from social science and hard science domains.

Instrumentation

In order to measure attitudes and usage, two 15 item-questionnaires were developed and a pilot study done with 20 subjects. In light of this pilot study some items were excluded and some others were changed. The internal consistency reliability of this pilot study was .68 for the attitude survey and .86 for the usage survey. These two surveys were combined with a cover letter and given as a set to the subjects (see Appendix A). A statement of confidentiality accompanied the questionnaires. The researcher assured the respondents of the confidentiality of their responses. It was pointed out that the researcher was not able to know the respondents since there were no identifiable information. The purpose of these questionnaires was to see if students have experienced cooperative learning techniques in different disciplines of graduate school that we divided into social and hard sciences. The statements in the survey focus on retention, achievement, ethnic relations, and the use of cooperative instructional methods. These two instruments will be used to compare social and hard science students. The attitude and usage scales follow a Likert-like format, asking respondents to indicate varying amounts of agreement or disagreement to the items on the instrument.

Procedure

The study was primarily concerned with two sets of questionnaires. The Cooperative Learning Attitudes and Usage surveys was administered to graduate students individually or in small groups. If needed any unfamiliar words or terms were identified

may were personally explained during the administration of the surveys. This was done in order to make the research more understandable. Those who were willing to be contacted for face-to-face interview at a later date was asked to write their name and phone number on a separate piece of paper.

These instruments were easy to administer and require approximately 10-15 minutes to complete. The questionnaires contained items that will assess the student's attitudes and experiences with cooperative learning techniques in graduate level instruction.

The primary focus was on what areas of graduate education cooperative learning is used or is being used more often than the others (Hypothesis 1) and if attitudes vary (Hypothesis 2). Additionally, the relationship between attitudes and usage of cooperative learning will be examined (Hypothesis 4).

In order to test those hypothesis, between- subject Anova was run for the first and second hypothesis. Third hypothesis was tested with factor analysis technique and for the fourth hypothesis mixed-Anova statistical techniques were used.

CHAPTER IV

RESULTS AND FINDINGS

In determining the relationships between social and hard science graduate students' usage and attitudes, several statistical techniques were used. For the first and second hypotheses, the average usage of and attitude toward cooperative learning were evaluated between social and hard sciences through a one-way Analysis of Variance.

Table # 3 Social Science Students Attitude Scores (in 15 item scale)

ATTITUDE	MEAN	S.D	VARIANCE	LOW	HIGH
Subject N=75	52.373	7.555	57.087	32	75

Table # 4 Social Science Students Usage Score (in 15 item scale)

USAGE	MEAN	S.D	VARIANCE	LOW	HIGH
Subject N=75	59.426	7.314	53.497	41	75

Table # 5 Hard Science Students Attitude Scores (in 15 item scale)

ATTITUDE	MEAN	S.D	VARIANCE	LOW	HIGH
Subject N=75	54.033	6.698	44.637	36	70

Table # 6 Hard Science Students Usage Score (in 15 item scale)

USAGE	MEAN	S.D	VARIANCE	LOW	HIGH
Subject N=75	58.093	7.022	49.311	34	74

As a result of factor analysis of both scale, two subfactors were found for each scale. A principle components factor analysis was conducted followed by a variance matrix rotation. Items in each factor was closely related to each other. Some items were by themselves independent and did not related with the other groups of items. Therefore, they were excluded.

In Usage score scale items number 1, 2, 4, 5, 6, and 8 were closely related with each other. They constituted factor first. Those items were primarily about the nature of cooperative learning, and the definition. Hence, it is called "Nature of Cooperative Learning (Factor 1)". Cronbach Alpha Reliability Coefficient for six items was .80. similarly, items about student relationship in school settings that is named "Cooperative Relationship (Factor 2)" in school settings for those six items again Cronbach Alpha Coefficient was.79.

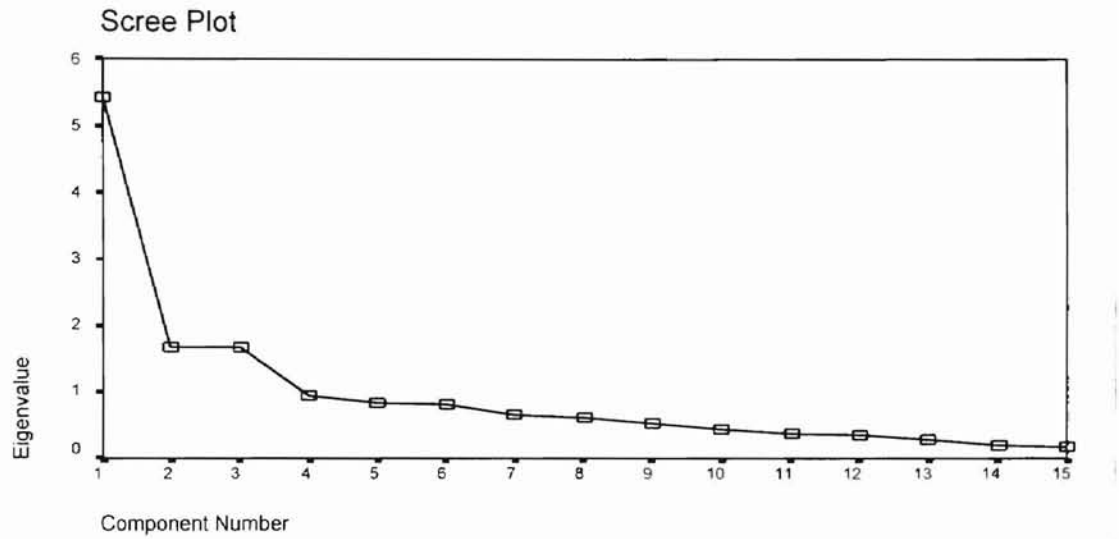
Table # 7

Reliability Coefficients for Usage Subscale.

Usage	Reliability Coefficients
Nature of Cooperative Learning (Factor 1)	.807
Cooperative Relationship (Factor 2)	.798

Table # 8

Eigenvalues for Usage Items.



Items number 9, 10, 11, 12, 13 and 14 were clustered as an first factor, which is called " Nature of Cooperative Learning". Those items as follows.

9-) In cooperative settings, students see their classmates as learning resources more often than in competitive settings.

10-) Cooperative learning increases students' persistence, particularly at the very beginning of graduate school, so that it reduces the drop out rate.

11-) Cooperative learning methods positively affect relationships between students of different races and ethnic groups.

12-) Students who participated in cooperative learning groups will become more intrinsically motivated.

13-) Engagement in cooperative learning activities will increase student's predisposition to cooperate later on in their lives.

14-) There are times in which technical equipment (computers, movies, TV, reading machines, etc.) can be incorporated in the cooperative learning techniques.

Table # 9

Rotated Matrix for Nature of Cooperative Learning (factor 1) Subscale

6 Items for factor 1	Loading
Number 12	0.854
13	0.806
10	0.693
9	0.566
11	0.540
14	0.483

Second subscale was consisted of items number 1, 2, 4, 5, 6 and 8. This subscale called Cooperative Relationship, those items as follows:

1-) Did you have any homework or projects which involved cooperative learning activities outside the classroom?

2-) Cooperative learning techniques (panels, mini discussions, reactions to role plays, group examinations, collaborative writings, class presentations, small group lecturing, etc.) are appropriate techniques to employ in your classroom.

4-) Cooperative Learning techniques can improve students achievement.

5-) Cooperative learning strategies can help students to apply better information learned into other areas.

6-) Cooperative learning techniques can be taught to all age students as social skills.

8-) Students who have participated in cooperative learning activities can recall more information those who work alone.

Table # 10

Rotated Matrix for Cooperative Relationship (factor 2) Subscale

6 Items for factor 2	Loading
Number 6	0.725
4	0.700
2	0.680
5	0.662
8	0.660
1	0.487

For the first hypothesis, social science and hard science students' Usage differences tested separately for factor 1 and factor 2. The same statistics was done for total score that was combination of factor 1 and factor 2.

The first hypothesis was testing the difference between social and hard science graduate students usage of cooperative learning techniques. In order to test this hypothesis a one-way ANOVA was run and the results indicated that there is no

statistically significant difference between social and hard science students usage of cooperative learning, in 15 item usage scale ($F_{1,74}$; 1.279 P>0.069). However, social science student usage score means was slightly higher than hard science students score. This means was 59.42 versus 58, 09. Moreover, when the same statistics done with total usage item the result was consistent with 15 item scale. General Cooperative Learning Total Usage score for 12 items was not significant between social and hard science graduate students ($F_{1,74}$; 1.70 P>0.630).

When the scale was divided into two subscale, for the nature of cooperative learning subscale (factor 1) scores between social and hard science students this was not significant. That is, social and hard science graduate students have almost the same kind of cooperative learning experience, understanding and definition with regard to cooperative learning in graduate level ($F_{1,74}$; 2.70 P > 0.0381).

As for the second factor of cooperative learning usage subscale, which is cooperative relationship, social and hard science students was also not significantly differed ($F_{1,74}$; 1.83 P> 0.802).

As a conclusion, social and hard science students were not differ in subscale of usage of cooperative learning. None of the total usage and usage subscale were significantly differed for social and hard science students.

Table # 11

All usage scores.

	Mean Hard Science	Mean Social Science	P Value
Total Usage (15 items)	59.42	58.09	0.069
Total Usage (12 items)	43.94	44.70	0.063
Nature of C. L. (6 items)	25.26	25.77	0.381
Coop. Relation (6items)	22.62	23.64	0.080

Additionally, for the second hypothesis, factor analysis techniques were done and two attitude subscales were defined. Attitude scales were also composed of two factor. Items number 1, 2, 6, 8, 9,11 and 12 were all related to how students like cooperative learning and how cooperative learning make them more capable in terms of critical thinking, and responsibility taking as group. Therefore, factor 1 named as "Favorable Attitude" toward cooperative learning. Those items as follows:

1-) Cooperative learning activities are more enjoyable than traditional instructional techniques.

2-) Students who participate in cooperative learning activities like school more.

6-) Students who tend to cooperate can be described as equally oriented.

8-) Cooperative learning participation increases students internal locus of control.

9-) Students who are engaged in cooperative learning activities can improve critical thinking.

11-) Cooperative classroom techniques reduce anxiety in students.

12-) Cooperative learning methods increase all group members willingness to take

responsibility for their learning.

Table # 12 Eigenvalues for Attitude Items.

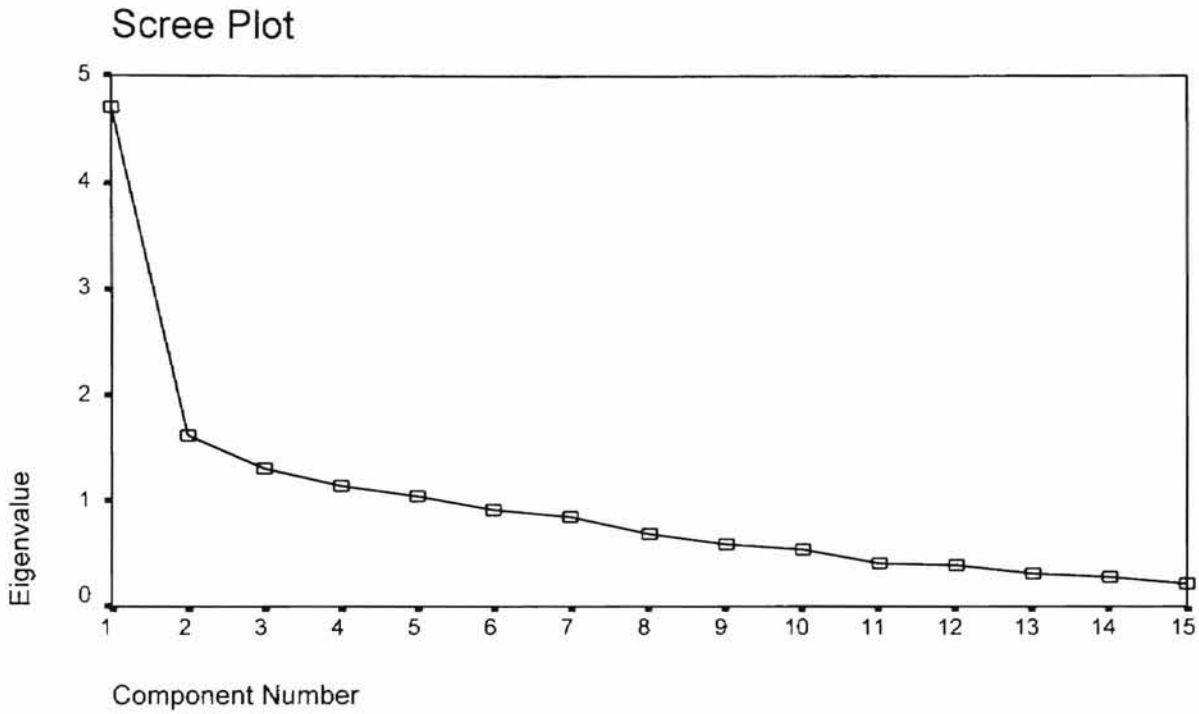


Table # 13 Rotated Matrix for Favorite Attitude (factor 1) Subscale

7 Item for factor 1	Loading
Number 11	0.720
9	0.709
1	0.685
8	0.595
2	0.573
12	0.516
6	0.452

Reliability coefficients was .81 for those 7 items.

With regard two second factor items, 3, 5, 7, 13 were clustered together as second subscale of the attitude test. Those items were about democratic chatter, altruism, and liking other classmates. Thus, it is called "Caring Attitude" subscale. Cronbach's Alpha Reliability Coefficient was .70 for those 7 items. Those caring attitudes items are as follows:

3-) Cooperative techniques cause people in these groups to like each other better.

5-) Students who tend to cooperate can be described as equally oriented.

7-) Cooperative learning techniques increase democratic attitudes and behavior on the part of students.

13-) Cooperative learning strategies increase students abilities to appreciate the views of others.

Table # 14

Rotated Matrix for Caring Attitude (factor 2) Subscale

4 items for factor 2	Loading
Number 7	0.713
3	0.696
5	0.686
13	0.560

Table # 15

Reliability Coefficients for Attitude Scale.

Attitudes	Reliability Coefficients
Favorite Attitude (Factor 1)	.817
Caring Attitude (Factor 2)	.700

The second hypothesis also was testing social and hard science graduate students attitudes toward cooperative learning. For this hypothesis a one -way ANOVA was run. The result revealed that there were no difference regarding social and hard science students attitudes toward cooperative learning in 15 item attitude scale ($F_{1,74}$; 2.017 P >0.064). Contrary to expectations, hard science students attitudes score means was slightly higher than social science students scores, 54.04 versus 52.34, respectively.

In general total 11 item Attitude scale there were significant difference toward cooperative learning between social and hard science students attitudes ($F_{1,74}$; 1.93 P <0.049).

In Favorable Attitudes subscale (factor 1), There were also significant difference between social and hard science students. Contrary to popular expectations, in both total attitude and favorable attitude scale, hard science student scored higher than their counterpart subjects ($F_{1,74}$; 2.23 P < 0.024).

In the second attitude subscale , which is "Caring Attitude" there were no significant difference between social and hard science graduate students ($F_{1,74}$; 2.14 P > 0.059).

Naturally, it can be concluded that people who are majoring different subject areas

had different attitudes toward cooperative instructional techniques. However, as the type of attitudes analyzed, social and hard science graduate students had differed significantly from each other. As shown, in the table, they did not differed total attitude score. On the other hand, they, significantly differed in subscale..

Table # 16

All Attitude Scale Scores

	Mean Hard Science	Mean Social Science	P Value
Total Attitude (15items)	54.04	52.32	0.064
Total Attitude(12items)	42.51	41.70	0.049
Favorite Attit. (7items)	26.21	24.90	0.024
Caring Attit. (4 items)	14.81	14.50	0.596

Consequently, social and hard science students were not differed in their usage scores. On the contrary, they were having different attitudes toward cooperative learning. They had differed in general total attitude scale and favorite attitude scale (factor 1). Furthermore, they did not differed in their caring attitudes scale. Therefore, it is considered that social and hard science students has some altruistic, democratic and caring feelings and behaviors toward their classmates. This was same regardless of their subjects areas.

Hypothesis 3 concerns establishing the reliability and the unidimensionality of the scales. The unidimensionality was evaluated with factor analysis of each 15-item scale. For each scale, two factors are generated having eigen values larger than one, then these factors was considered to be subscales and used together with the total scale in all

subsequent analysis. Reliability coefficients was computed for each scale and subscale by Cronbach`s alpha.

For hypothesis fourth, a mixed- ANOVA was calculated between attitudes and usage scores to see whether any relationship exists. In this design all students nested either hard or social science conditions, students crossed both usage and attitudes contains. Analysis of Mixed-ANOVA design in 11 and 12 item usage and attitude scale indicated that students attitudes and usage scores differ regardless of whether students were social or hard science students. Results revealed that attitude scores toward cooperative learning were significantly differed between social and hard science student ($F_{1,148}$; 212.74 $P < 0.00001$). In social and hard science group difference between attitudes and usage was significant.

Table # 17

General Relationship Between Usage and Attitudes.

	Mean	P Value
General Usage (12 item, N=150)	44.32	0.0001
General Attitude (11 item, N=150)	39.70	

Analysis of Variances results reveals that, students who had experienced cooperative learning had more favorable attitude than non-experienced students. It can be interpreted that student has to participate and experience cooperative learning before they develop attitudes. There were significant difference between graduate students usage and attitudes scores.

Table # 18

The relationships between Hard Science Students's Usage and Attitude

Hard Science (N= 75)	Mean	P Value
General Usage (12 items)	44.94	0.0001
General Attitude (11 items)	42.51	

Table # 19

The relationship between social science students' usage and attitudes.

Social Science (N=75)	Mean	P Value
General Usage (12 items)	44.70	0.0001
General Attitude (11 items)	41.70	

As shown above tables, analysis of variance technique reveal that there were a strong significant relationship between usage and attitude scores for both social and hard science students ($F_{1,148}$; 216.79 $P < 0.0001$).

CHAPTER V

CONCLUSIONS AND DISCUSSIONS

In this present study, social and hard science students did not differed in their both 15 item and 12 item usage scale (Table # 16). Similarly, when the factors evaluated in the "nature of learning" subscale they were not significantly differed. This can be explain by the fact that now students in hard science, humanities and social sciences students have more access than ever to experience and participate cooperative group assignment or projects. Regardless of their subjects, they somehow used cooperative learning activities and they are aware of it's benefits. In "Cooperative Relationship" subscale student from different social and hard science background did not differed. That is, all students in graduate level learned how to cultivate and maintain helping relationship and they were aware of the importance of cooperative relationship in school life. Previously, in university a lot of emphasis were given academia ; however, nowadays the instructors believed that students must be taught social skills and prepare them real world. The "Nature of Cooperative Learning" items were not perceived differently by both groups. Consequently, social and hard science groups were not differed in their score on 15, 12 general usage, 6 item nature of cooperative learning and 6 item cooperative relationship scale. This reveals that both social and hard science graduate students are having common experience, definition and understanding of cooperative learning. This conclusion can be made for the cooperative relationship subscale as well. As a result, current study proved that students in social and hard sciences have similar perception and opinion about cooperative activities in university

settings. This current study was not consistent with Kagan et al.'s (1985) argument about cooperative learning activities in university classroom. Kagan did not mention types of cooperation. Therefore, his argument is based on general usage of cooperative learning. Even, in this case, present findings did not differed for two group in 15 and 12 item usage scale.

Kagan et al.(1985) remarked that students are not interacting with their teachers or classmates. Very little prosocial socialization occurs within typical traditional classrooms. Kagan further stated that over 90 % of undergraduate students have not ever worked together on a academic project. Correspondingly, in another argument Kagan speculated that in his undergraduate classes, only 15 % percent of the students had worked on a cooperative learning project. He cautioned that most students somehow manage to go through the educational system without working with any of their classmates. In his contention, he believed that altough most students at the university level have never worked together in cooperative groups, when they had a chance most of the welcomed cooperative learning group activities. Similarly, Goodsell et al. (1992) stated that many students done small group work in high school and university classes, but those works rarely cooperative in nature. In contrast to Kagan's argument, 13 years later, this present study revealed that 68 % percent of graduate social science students had said yes, and 27 % percent said no versus 68 % graduate hard science student said yes and % 26 said no to this survey items " Did you have any homework or projects which involved cooperative learning activities outside the classroom". This findings proved that over the last decade cooperative learning activities has been accepted and very widely used in graduate and undergraduate level classes in all subject areas. New technologies

requires lifelong learning and diverse societies requires social and communicative skills to work and live harmoniously. Thus, the cooperative nature of scientific and technological work should be strongly reinforced by frequent group activity in classroom. Today's scientist and engineers work mostly in teams and less often as isolated individuals (Cooper, et al.1990). In the same way, Kagan et al. (1985) took the view that even tough students generally do not worked cooperatively together in educational settings, they are expected to do so when they get into job market. Today, it is hard to find job that does not require cooperative effort. Kagan, remarked that cooperative learning activities increase social concern and responsibility feelings as well as decrease selfishness and aggression among students. For these reasons, students must use and experience cooperative approaches during their educational experiences so that they may have a better background for future carriers. Because of this reason the cooperative learning strategies have been used in almost all discipline areas (Millis, 1998). The cooperative learning format has been successfully used in college courses in algebra, geometry, calculus, social psychology biochemistry, reading, language arts, social studies, medical disciplines and science. (Lynch, 1984, Millis 1998).

With regard to attitude scores, students from social and hard sciences did not differed significantly in 15 item general attitude scale. When the attitude items were clustered according to their nature in to subscales both group significantly differed. In favorite attitude scale, which was dealing with critical writing, critical thinking, creativity and responsibility issues. The results suggest that student from different educational backgrounds have different opinion and attitudes about creativity, critical thinking ability and responsibility for each others learning. In Favorite Attitude scale hard science

students means was slightly higher than social science students (26.21 versus 24.90). Caring attitudes items were related to democratic characteristics, altruism and close relationship among students. In this subscale, there was no significant relationship. Again, hard science student scored at the same level. (14.81, versus 14.50). it can be concluded that students regardless of their subject areas care about their classmates and show full respect as individuals. Present evidence reveal that there was significant relatonship between students usage and attitudes (Table # 18). This currents evidence was consistent with Davidson's (1985) study. Davidson (1985) conducted an experimental design by using a cooperative learning based small discovery method and traditional lecture methods and compared six courses ranging from high school to college level. Findings showed that there were no statistical difference in achivement scores., in addition Davidson reported that attitudinal survey given to students studying mathematics in cooperative groups indicated positive attitude responses to the teaching methods, including greater liking for mathematics than in teacher-centered lecture format. However, analyses of variance revealed that there was significant relationship between social and hard science students' usage and attitudes score (Table # 19, 20). This relationship was statistically significant for students' usage and attitudes as well (Table # 18). Therefore, it can be concluded that students participated cooperative learning activities had more positive attitudes toward cooperative learning methods. This findings was also supported by Boyatzis (1994) study. Boyatzis (1994) investigated academic achivement and student's attutedes toward cooperative learning. In his study, attitudes measured with the university's standard student evaluation form with regart to presentation, stimulation, effectiveness, instructor, and organization. The analysis of

differences in attitude revealed that the use of cooperative learning techniques promotes positive attitudes toward classroom instruction. Similarly, Boyatzis' finding was consistent with this current study, however, hard science student attitudes mean score (54.04) was slightly higher than social science students (52.34). General attitudes score were significantly different for both groups in 11 item attitude scale.

George (1994) argued that although there is big interest and support cooperative learning application in college and university settings, very little research have been done in postsecondary education. On the other hand, in contrast to, Slavin (1990) stated that three were over 575 experimental and 100 correctional studies proved that cooperative learning is one of the most thoroughly researched among in all instructional methods. As parallel Slavin's argument in this present research literature review showed that there have been done a lot about cooperative learning, in particularly in the 1990's in college, university and even in graduate level education.

Cooperative learning is based on a nonelitist educational philosophy that underlines the growth and achievement of each student by emphasizing the power of structured, supportive group work to increase individual and academic and social potential of individuals. For this reason, many psychologists and educational expert advocate cooperative learning.

Slavin (1989) argued that many faculty members were reluctant or skeptical about the effectiveness of cooperative learning. In this study 38 percent of subjects were attending graduate school and at the same time teaching undergraduate education. Overall, all statistics results proved that faculty members and teaching assistants are not any more reluctant or agnostic to use cooperative techniques in their classrooms. They

have chosen items in favor of cooperative learning. However, as it was exemplified in literature section, over the last year cooperative learning became accepted and integrated in all college education. As a result, many faculty members in various institutions have successfully employed cooperative learning techniques. This become a core of curriculum in some classes and major policies in some institution.

Cooperative learning advocates such as David and Roger Johnson, Robert Slavin, and Spencer Kagan continuously reported that cooperative learning resulted in high academic achievement, make student learn how to learn and learn from one another and provides necessary training for communication and relationship skills.

Suggestions for Successful Application of Cooperative Learning

Instructors must realize that simply telling and placing students in a discussion group will not grantee to produce effective outcomes (Johnson , Johnson & Smith 1991). A most important step for instructors is to share their objectives and reasoning with students. The instructors must determine his instructional goals both in terms of academic and social objectives. Therefore, cooperative learning should be introduced with a brief rationale and the reason for departure from traditional lecture format will be explained in a plain and clear manner. Group participants should know why they are being taught in this way, what is the main purposes and objectives, what their tasks are, what and how they are expected to achieve and how they will be targeted. This sort of information can be explained or disseminated be giving a handout (Cooper et al., 1990). Likewise, it is necessary that the use of cooperative learning explained on the first day of

class so that totally reluctant students may not to chose to participate cooperative classroom and find another section of the same class.

Those who are new to cooperative learning and those who have tried unsuccessfully other less structured forms of group work should begin initially with the basic structures such as Think-Pair-Share (Kagan, et al. 1985). Instructors who have succeeded in basic and advanced cooperative learning structures, can add more complex cooperative learning structures. In advanced graduate level, the use of a reflective log may be an appropriate strategy. Students in advanced gradate level, may have higher levels of involvement in cooperative projects. Yet, in order to perform complex cooperative learning methods instructors must plan carefully each classroom activity. If cooperative learning activities are well planed, clearly organized and obviously relevant to the course objectives, most students find team learning an enjoyable and highly involving activity. Involvement in learning, involvement with other students, and involvement with faculty are factors that make other students an overwhelming difference in student retention and success in college.

Ekroth (1990), in his words, " Today's professors are challenged to teach a student population, increasingly diverse in age, levels of academic preparation, styles of learning, and cultural background. Professors are now expected not only cover the material, but also to help students to think critically, write skillfully and speak competently". In the same way, Smith (1996) cautioned that most university professors usually do not feel a need to contribute the social development. They assumed that many student already have necessary skills. However, many students have never worked cooperatively in learning situations and therefore the needed social skills for

communication and cooperation (Johnson, Johnson & Smith, 1991). Instructors have to make sure that students are ready and have necessary human relation skills to conduct a successful group work. Students must communicate effectively, provide leadership for group's work, build and maintain trust among members and resolve conflicts within their group constructively. Otherwise, group can not function effectively without social skills, that is if students do not have and used the needed skills in leadership, making decisions, building trust, communicating, and managing conflict. Therefore, these skills must be taught just as purposefully and precisely as academic skills. An innovative an progressive instruction must begin with an awareness of social skill needed for successful cooperative work; leadership, shared decision making, trust, effective communication and conflict management. These skills are developed through the use of warm up exercises, social task, and group roles. Warm up exercises can take place during the first week of the semester. First 5 to 20 minutes, at the begins of second or third class period must be allotted to warm up activities. Social interaction can be started by introducing their names, memory cue, favorite movies, best times, academic strength, weakness or any other kind of stay point. The other strategies must be introduced slowly, once one strategy at a time. At the beginning of each semester there is generally some resistance to cooperative learning classes. Instructors must be patient and tolerant and wait some time before seeing fully functioning cooperative groups.

There are many different ways to form cooperative groups in college education that suit needs of almost all class types no matter what the subject area. For example, informal cooperative group which is short term and less structured. Informal groups can be used along with lecture. Instructor helps students to focus their attention on material,

set expectations etc. Students are able to study in three to five minutes discussion before and after the lecture. Formal cooperative groups are more structured and stay together until the task is done; and cooperative base groups, which are long term groups whose primary role is one of peer support and long-term accountability. Formal cooperative learning groups instructor structures the learning groups regarding group size, volunteer or assigned. Instructors holds power and teach academic concepts and principles. During the course of academic year, instructor teach cooperative skills, provides assistance and guidance. Formal groups are small (2-4) member groups formed by the professor to do a specific job such as review homework, work on a problem, review homework, work on a problem, review a test, or a lab experiment. On the other hand, cooperative base groups is used to support student, encourage and assisted in many areas in which he or she need to make academic progress. The length of cooperative base groups vary from one semester to a whole college life. Basically, it provides long term caring relationships that necessary to encourage the students work hard and graduate from college. Base groups are long term, small (3-5 member) group with stable membership whose primary responsibility is to provide support, encouragement, and assistance in learning the material and completing the assignment. The faculty member must define her/his objectives and then set up formal, informal or base groups according to the nature of the subject and goals.

Cooperative learning activities would be especially helpful for English as a Second Language (ESL) students who have strong oral communication problems, even after graduation from ESL programs and enrolling in regular classes. Students whose primary language is not English may especially find their anxiety reduced by working in

cooperative learning groups in college (Johnson et al. 1991). Cooperative learning may provide a more active and nonthreatining opportunity for ELS students gain more fluency and confidence (Cooper et al. 1990). International students may lack the verbal fluency in English to communicate easily with peers. Pairing the international students with native speaker or having instructor meetings with the student to ensure knowledge of critical information prior to participation in cooperative teams, may reduce the potential difficulty.

As Vygotsky (1978) argued learning is a social process that happens through interpersonal interaction within a cooperative environment. For this reason, cooperative learning is based on a constructivist view of knowledge, one in which students come to know something by building on existing schemata, continuously testing, revising, and refining knowledge within a social interaction. Individuals, working cooperatively, construct their understanding by sharing. Learning becomes more fruitfully and meaningful when relationships are personal as well as professional.

Consequently, on the one hand, faculty members who are using cooperative learning methods in conjunction with their own philosophy will discover more management powers and joys in teaching, on the other hand students in cooperative learning settings will discover new joys in learning as well as teaching to their groupmates.

Research must continue to test the limits of cooperative learning to broaden our understanding of why and how cooperative learning produce its various effects.

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APPENDIX A

Cover Page for survey

Cover Page for Survey

Dear Graduate Student,

The following questionnaires are developed in order to investigate the effective usage of cooperative learning techniques at the graduate level. Therefore we need some more information about you which would allow us to make some other comparison with other students. All identifiable information will be strictly confidential. Also, please feel free to skip any question you do not feel comfortable answering.

Thank you so much for your time and your help..

Please, write your majoring area here,.....

Your current educational level:

Currently enrolled in a masters program ( )
Currently enrolled in a doctorate program ( )

At the present moment, are you also teaching classes?

Yes ( )
No ( )

Your age is

between 20-24 ( )
between 25-29 ( )
between 30-40 ( )
above 40 ( )

Your gender is

male ( )
female ( )

Ethnic origin

White ( )
African American ( )
Native American ( )
Asian American ( )
Other ( ) please specify: _____

Are you an international student?

Yes ( ) please write your nationality _____
No ( )

APPENDIX B

Usage Survey

Usage Survey

Definition of Cooperative Learning: Cooperative learning is a structured, systematic instructional strategy in which students work together in small groups toward a common goal. More concretely, it is a set of alternatives to traditional instructional system. Cooperative learning is techniques in which students work in heterogeneous groups of four to six members and earn recognition, rewards, and sometimes group approval based on the academic performance of the whole group.

SURVEY QUESTIONS ABOUT USAGE OF COOPERATIVE LEARNING TECHNIQUES IN GRADUATE LEVEL CLASES

1- Did you have any homework or projects which involved cooperative learning activities outside the classroom?

Yes ( ) No( )

2 - Cooperative learning techniques (panels, mini discussions, reactions to role plays, group examinations, collaborative writings, class presentations, small group lecturing, etc.) are appropriate techniques to employ in your classroom.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

3- Many graduate students and professors have little experience with cooperative learning and therefore find themselves uncomfortable with the cooperative learning.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

4 - Cooperative learning techniques can improve students' achievement.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

5 - Cooperative learning strategies can help students to apply better the information learned into other areas.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

6 - Cooperative learning techniques must be used along with other techniques rather than by themselves.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

7 - Cooperative learning techniques can be taught to all age students as social skills.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

8- Students who have participated in cooperative learning activities can recall more information those who work alone.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

9 - In cooperative learning settings, students see their classmates as learning resources more often than in competitive settings.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

10 - Cooperative learning increases students' persistence, particularly at the very beginning of graduate school, so that it reduces the drop out rate.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

11 - Cooperative learning methods positively affect relationships between students of different races and ethnic groups.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

12 - Students who participate in cooperative learning groups will become more intrinsically motivated.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

13 - Engagement in cooperative learning activities will increase students' predisposition to cooperate later on in their lives.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

14 - There are times in which technical equipment (computers, movies, TV, reading machines, etc.) can be incorporated in the cooperative learning techniques.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

15 - Cooperative learning methods can be used with students through asynchronous e-mail discussions, or synchronous chats, or virtual learning environments.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

APPENDIX C

Attitude Survey

Attitude Survey

SURVEY QUESTIONS ABOUT GRADUATE STUDENTS ATTITUDES TOWARD COOPERATIVE LEARNING TECHNIQUES IN GRADUATE LEVEL CLASES.

1. Cooperative learning activities are more enjoyable than traditional instructional techniques.

   Strongly agree( ) Agree( ) Undecided( ) Disagree( ) Strongly disagree( )

2. Students who participate in cooperative learning activities like school more.

   Strongly agree( ) Agree( ) Undecided( ) Disagree( ) Strongly disagree( )

3. Cooperative techniques cause people in these groups to like each other better.

   Strongly agree( ) Agree( ) Undecided( ) Disagree( ) Strongly disagree( )

4. Cooperative learning and teaching activities may frequently cause classroom management problems.

   Strongly agree( ) Agree( ) Undecided( ) Disagree( ) Strongly disagree( )

5. Students who tend to cooperate can be described as altruistic.

   Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

6. Students who tend to cooperate can be described as equality oriented.

   Strongly agree( ) Agree( ) Undecided( ) Disagree( ) Strongly disagree( )

7. Cooperative learning techniques increase democratic attitudes and behavior on the part of students.

   Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

8. Cooperative learning participation increases students internal locus of control.

   Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

9. Students who are engaged in cooperative learning activities can improve critical thinking.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

10. Cooperative learning strategies are effective in social sciences, hard sciences, and all subject areas.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

11. Cooperative classroom techniques reduce anxiety in students.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

12. Cooperative learning methods increase all group members willingness to take responsibility for their learning.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

13. Cooperative learning strategies increase students abilities to appreciate the views of others.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

14. In a cooperative learning atmosphere, high-achieving students would be hampered by low-achieving students.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

15. Cooperative activities inhibit individuality and therefore make people feel less important as individuals.

Strongly agree ( ) Agree ( ) Undecided( ) Disagree( ) Strongly disagree( )

If you have additional ideas, comments, or complaints please write them on the rest of this paper. Thank you again for your help!!

APPENDIX D

IRB Approval Form

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: March 22, 1998 **IRB #: ED-98-095**

Proposal Title: COOPERATIVE LEARNING TECHNIQUES: USAGE AND ATTITUDES AMONG GRADUATE STUDENTS

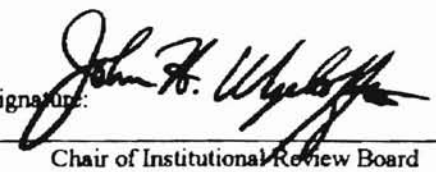
Principal Investigator(s): Kay S. Bull, Sefa Bulut

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING, AS WELL AS ARE SUBJECT TO MONITORING AT ANY TIME DURING THE APPROVAL PERIOD.
APPROVAL STATUS PERIOD VALID FOR DATA COLLECTION FOR A ONE CALENDAR YEAR PERIOD AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL.
ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Disapproval are as follows:

Signature: 

Date: March 23, 1998

Chair of Institutional Review Board

cc: Sefa Bulut

VITA

Sefa Bulut

Candidate for the degree of

Master of Science

Thesis: COOPERATIVE LEARNING TECHNIQUES AT THE GRADUATE LEVEL; USAGE AND ATTITUDE AMONG GRDUATE STUDENTS

Major Field: Applied Behavioral Studies

Biographical:

Personal Data: Born in Kelkit, Turkey, April 3, 1972, the son of Mr. and Ms. Ibrahim and Elmas Bulut

Education: Received the Bachelor of Science degree in Psychology from Ankara University in June 1993. Attended teacher certification program at the University of Ankara in 1994. Completed requirements for Master of Science degree in Educational Psychology from Oklahoma State University in July, 1998.

Professional Experiences: Participated in psychology internship program in a state run psychiatry clinic one semester in 1993 in Ankara. Worked one semester as high school teacher in humanities in 1994 in Edirne.