STUDENT PERCEPTIONS OF COOPERATIVE LEARNING IN THE COST/MANAGERIAL ACCOUNTING CLASSROOM

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Traditional methods of teaching accounting relegate students to passive learning roles. In an attempt to shift from a passive to an active learning environment, a cooperative learning format was introduced. Cooperative learning has been found superior to the traditional competitive class environment in terms of learning and interpersonal skill enhancement in studies involving primarily elementary and middle school students. In this article, the authors report student perceptions concerning cooperative learning in the collegiate managerial and cost accounting classrooms. The reported perceptions suggest that cooperative learning in the business school classroom enhances both objective and subjective learning and increases communication skills.

In the traditional method of teaching accounting the professors lecture, demonstrate problems in class, review assigned homework, and answer questions. The students are relegated to playing a passive role, for the most part, in each of these activities. In this environment they listen, observe and take notes. The instructor assigns grades based on such easily quantifiable areas as attendance and preparedness (as measured

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through quizzes and tests). The emphasis is on the individual and success is dependent on individual effort and evaluation.

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But, as Boyer et al. (1984-85) point out, our culture is based more and more on our dependence upon one another and our ability to interact with one another in group settings. Throughout the accounting profession the emphasis is shifting from individual performance to teamwork. Jim Butler, chairman of KPMG Peat Marwick, stated that the biggest challenge facing him was fostering teamwork among the 76,000 people in KPMG firms worldwide in face of the rapidly changing sociopolitical environment (Adriance, 1992).

This changing emphasis is seen from the largest public accounting firms to the smallest, as well as within private and governmental organizations. For example, Mavrovitis (1992) details the necessity for cooperative working relationships between accounting and treasury within a firm for corporate success. Yet, it is estimated that over 85% of the instruction taking place in school is centered around lectures and work involving no interaction among students: in many instances, students are discouraged from interacting and are pitted against one another in a competitive classroom environment (Johnson & Johnson, 1983).

Traditional approaches to classroom instruction may no longer be appropriate in today's interactive and action-oriented world community. Of the three classroom learning environments - individualistic, competitive and cooperative - research has shown the latter to be the most conducive to learning (Johnson & Johnson, 1989). The skills needed to function in the teamwork-oriented accounting arena of today are not being taught in a competitive classroom design. In the cooperative environment, where students are organized into small groups and work together to attain common goals, these skills are emphasized. In this paper, we offer empirical evidence that many of the suggested benefits of cooperative learning can be obtained in collegiate teaching of accounting.

BACKGROUND

Classroom learning environments have been classified into three general types: individualistic, competitive and cooperative (Johnson & Johnson, 1975). In the individualistic classroom, students' goal achievements are not related to the goal achievements of their fellow students. Students involved in computer assisted instruction are an example - where students work at their own pace to complete the exercise. In the competitive classroom, individuals attain their goals only when their fellow students fail to achieve their own. Here students have individual responsibility to attend classes and must compete with one another for grades. Although most of today's collegiate classrooms are oriented to a competitive environment, research has shown that, of the three approaches, a cooperative environment is the most conducive to learning (Johnson et al., 1981).

In the cooperative environment, students are organized into small groups and then work together to attain common goals. Students discuss the material among themselves, which helps them to gain a better understanding, and encourage one another to work harder (Johnson & Johnson, 1984-85). The cooperative environment not only fosters

teamwork, but also develops better social interaction and communication skills required in the business world today.

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An example of the potential impact of group learning was demonstrated by Barnes (1991) in a simulation of a cooperative learning environment. In this simulation, there was an obvious shift in emphasis from an individual, competitive atmosphere to one of group responsibility and cooperation. After participating in the cooperative learning simulation and reading selected research describing successful attempts at alternate approaches to classroom instruction (Cook et al., 1993; Johnson & Johnson, 1975, 1983, 1984-85; Johnson et al., 1981), the primary author introduced group learning techniques into a managerial accounting class.

To implement a cooperative learning environment at the college and university level, part of the challenge is to overcome resistance to change from a system that has encouraged and rewarded competition to one where the emphasis is on group interaction. The traditional competitive learning environment is oriented toward individual achievement and personal choices, where instructors can assign grades based on such easily

quantifiable areas as attendance and preparedness (as measured through quizzes and tests). In contrast, a cooperative learning environment requires students to meet group expectations, thereby subjecting them to more personal risks. Faculty also face more personal risk in the cooperative environment as they abandon the traditional, secure teaching methods for their new roles as facilitators in the learning process.

For decades cooperative learning (previously termed "small-group learning") has been used successfully in a variety of elementary and secondary classroom settings (Davidson, 1990; Hassard, 1990; Johnson & Johnson, 1989; Newmann & Thompson, 1987). But only in recent years has cooperative learning been looked at as an alternative approach to the traditional lecture/competitive format used in the college classroom (Cottell & Millis, 1992; Cooper et al., 1990; Cooper & Mueck, 1989).

Simply placing students in groups does not create a cooperative learning environment. Several criteria must be met for this type of environment to occur: (a) positive interdependence, (b) individual accountability, (c) responsibility for each other's learning, (d) collaborative skills, (e) instructor observation and intervention, and (f) group processing (Johnson & Johnson, 1984-85).

Positive interdependence is achieved by structuring the groups in such a way that individual success is dependent on the success of the group. Balancing interdependence, individual accountability stresses individual student assessment and feedback from the instructor on the student's progress. The group members are also expected to help one another complete the assigned work and, thus, have responsibility for each other's learning. Collaborative skills such as leadership, communication and decision making are an integral part of the group environment as the instructor observes the groups and gives each group feedback on their performance. Group processing includes the procedures and time that enable students to analyze how effectively their group is functioning in the

cooperative learning environment and to determine how well they were using their collaborative skills.

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Based on the apparent and anticipated benefits to be gained from a cooperative learning environment, the preceding criteria were incorporated into a pedagogical design for a one semester managerial accounting class. In approaching this undertaking, several concerns needed to be addressed: (a) number and size of the groups; (b) assignment of grades; (c) permanency of the groups; (d) if changed, how often; (e) quantity of in-class lecture vs. group time; (f) size and arrangement of the room. Workable solutions to most of the these problems were developed from information contained in previous research on group practices (Johnson et al., 1981; Cook et al., 1993), discussions with other faculty members, and intuition.

PROPOSITION DEVELOPMENT

Benefits of cooperative learning have been recognized for many years. Slavin (1990) asserts that there is wide agreement among cooperative learning scholars regarding its positive effects on learning. Reviews of empirical research indicate that learning is usually enhanced by the incorporation of cooperative learning (Slavin, 1989; Johnson et al., 1981).

In addition to increased learning, other effects result from the use of the cooperative learning format (Nastasi & Clemens, 1991). The cooperative environment not only fosters teamwork, but also develops better social interaction and communication skills (Denee, 1991; Hassard, 1990). Students have shown gains in liking and respect for each other and in the ability to work together effectively, as well as increased liking of the subject, school, studying, and improved attendance.

However, problem areas have also been cited in previous research. As Jalajas and Sutton (1984/1985) point out, human groups bring out the best and the worst of the species. They have identified five types of students associated with inter-group conflict, which they label the Whiner, the Martyr, the Saboteur, the Bully and the Deadbeat. Others have also described problem students as "hitchhikers" (Cottell, 1991) and "social loafers" (Schnake, 1991). These terms refer to students who come to class unprepared to participate in their group, or who do not come at all. They rely on the other members of the group to carry them through the process.

Slavin (1990) points out that relatively little investigation has occurred at the college level. The strongest effects have been exhibited at elementary and middle schools. Collegiate level results are less consistent than those found in elementary and middle school studies.

In an exploratory study, Wolverton (1993) designed a cooperative learning environment for a college level managerial accounting class - changing the emphasis from a traditional lecture format to a group-oriented approach. This research was to determine the suitability of cooperative learning in a collegiate setting and to identify areas of concern for future research. The overwhelming student response to open-ended evaluation questions regarding the group environment was favorable. The benefits mentioned most often were that the students received help from others in learning and understanding the material, had the opportunity to meet other people in class and get to know them, had the opportunity to apply what they were learning to a problem (hands on experience), obtained faster

feedback to questions than in a traditional setting, and the format forced harder work and a higher level of preparation due to group pressures. Answers to the open-ended evaluations suggested that students perceived two primary problems: Some students came to class unprepared or unwilling to participate in the group problem solving, and some dominated the group.

Based on previous literature and the results of the just-described exploratory study, we offer and subsequently test the following propositions.

P1 Collegiate accounting students will report more positive learning attitudes and study behaviors attributed to the cooperative learning environment.

P2 Collegiate accounting students will report enhanced social and communication experiences and skills due to the cooperative learning format.

P3 Collegiate accounting students will report problems regarding negative group member behaviors (such as social loafing) due to the cooperative learning format.

P4 A cooperative learning environment will enhance academic achievement among collegiate accounting students.

Propositions one through three represent students' subjective perceptions regarding cooperative learning, while proposition four relates to the objective learning effect. In order to test these propositions we introduced the cooperative learning environment in two separate collegiate accounting classes. These two studies are described in detail below.

STUDY 1 - MANAGERIAL ACCOUNTING CLASS

Classroom Design - Study 1

The collegiate accounting class in the first study was a sophomore level managerial accounting class. This class of 17 students met twice a week for two hour periods during the semester. The students were divided into groups of three or four with those students sitting closest to one another making up the groups (Artzt & Newman, 1990). The groups were changed after each exam (three times) during the term with the intent of having the groups made up of different students each round. No special consideration was given to class standing of the students.

Each class period began with a brief lecture covering the concepts that would be illustrated in the textbook problems for the day. Following the lecture, one to three problems were assigned for the groups to complete. Collaborative skills of leadership, decision making, conflict management and trust building were included in the design by requiring each group to select a "designated writer" for every problem assigned. For a problem, each group could prepare only one solution which represented the collective efforts of the group. Group members were responsible for dividing this responsibility equally among themselves over the course of the term.

Through the use of presentations, an environment was created in which students were responsible for each other's learning. Toward the end of the class period, several students were selected by the instructor to present their groups' solutions to the class. All members of the groups, therefore, had to be sure that everyone in their group understood the material and could explain it to the rest of the class. The presentations thus required and reinforced the need for collaborative communication skills. Copies of the textbook solutions to all problems were handed out to the students after the presentations. Presentations took place in approximately 1/3 of the class sessions. When presentations did not occur, solutions to the problems

were handed out as each was completed. This allowed for immediate feedback to the groups.

Grading was structured in such a way that both group and individual performance could be evaluated. By incorporating group factors into the grading, a positive interdependence was achieved - students could easily discern that part of their evaluation was based on the performance of other group members. The group portion of each student's grade was assigned by combining two factors: (a) instructor observations of the group performance and (b) the use of a structured peer evaluation form (Cook et al., 1993). A copy of the peer evaluation form was given to students the second week of class. This enabled students to become familiar with the criteria that would be used to evaluate group performance. A review of the criteria was designed to impress upon them the importance of individual participation in group activities and eliminate problems of social loafing (Schnake, 1991).

The peer evaluation form not only asked students to assign an overall rating to each person in their group, but it also broke down ratings into other criteria (collaborative skills) such as leadership, quality and quantity of contribution, creativity, effort, turntaking and attendance. Each student also explained in a short paragraph the good and bad points of how well their group worked together. The evaluation forms were completed by the students three times during the term as group membership changed. The individual accountability criterion was accomplished through individual quizzes and exams.

Method for Empirical Investigation - Study 1

To test the preceding propositions we utilized both objective and subjective measures of learning. An end-of-semester survey was administered in the managerial accounting class just described ($n = 15$) to obtain student perceptual input regarding the success and effects of the cooperative learning environment. Survey items were Likert scale

agree-disagree statements (1 = strongly agree, 5 = strongly disagree), developed to ascertain student perceptions of learning, group interaction, and problem situations. In addition to these subjective student self-report measures, an objective measure of learning was obtained by comparing students' total point scores on three accounting problems with those from a "control group." The control group consisted of twenty-one students taking the same course, using the same text, at approximately the same time of day from a different instructor using the traditional lecture class format.

Results - Study 1

Likert scale responses were analyzed to determine student perceptions of learning and study habits, communication and social experiences and skills, and negative student behaviors. Means and standard deviations were calculated for each scale item. To test for significant effect, t-tests were conducted comparing item means to the neutral point of each scale (3).

Learning Effects

We proposed that students would report more positive attitudes and behaviors toward learning (P1). Students reported that the group class format increased their learning, their attentiveness, the amount of time they studied, and their preparedness. Overall, they perceived the group design positively, preferring the group format over the lecture format and desiring that such groups be used in other courses. See Table 1 for means, standard deviations, t scores and p-values of scale items used.

Communication/Social Interaction Effects

Items relating to communication and social interaction effects were used to test P2. (See Table 2 for specific items.) Students indicated that they enjoyed working in groups, and that the group format allowed them to become better acquainted with their classmates and made class more fun.

In addition, they believed that working in groups enhanced their oral skills. The "designated writer" component of the groups was seen as a generator of group interaction, although the oral presentations in front of the class were not viewed as significant skills boosters. Students strongly believed that explaining to other group members helped them learn and agreed they frequently had been helped to learn and understand by their fellow group members. They also indicated that the group format added an applied, real world, "hands-on" dimension.

Contrary to our expectation, in-class group activity did not result in out-of-class group activities. For both homework and tests, students reported that they studied outside of class by themselves, not with their in-class group members. Interestingly, although they did not take advantage of the group "support system" outside of class, students did agree that working in groups increased their sense of control and their commitment to the class.

Negative Effects

Although experts have suggested that cooperative learning may lead to various negative behaviors (P3), the students in our study did not report any significant negative effects. They reported no serious problem with unprepared members, dominating members nor social loafers. They did not relate that any members needed to do a disproportionate amount of the work in order to make up for members who did not carry their share of the workload. In addition, students did not agree that they could cover up poor preparation because of the group format. Items suggest that the peer evaluation process may have been a strong motivator for all students to contribute to their groups. (See Table 3 for items and means.)

Objective Learning Effects

We also proposed that students would exhibit higher objective learning when taught in the cooperative education format (P4). Therefore, to

supplement the subjective measures of learning, individual student scores on three accounting problems were acquired and then averaged over the 17 students. Students from the "control group" were administered the identical three problems. The primary author graded these 21 students' answers, and their scores were averaged. Treatment group students missed an average of 6.29 points over the three problems (s.d.= 5.698) while the "control group" missed, on average, 10.33 points (s.d.= 6.191). This difference is significant and in the direction proposed (i.e., cooperative learning environment students exhibited higher objective learning than traditional lecture/individual format students).

STUDY 2 - COST ACCOUNTING CLASS

Classroom Design - Study 2

The second collegiate accounting class was an upper division cost accounting class which met three times a week for three hour periods during a seven week summer semester at a different university. The class consisted of junior/senior level accounting majors. At first, the 16 students were divided into groups as described in Study 1. The groups were only changed once half way through the term. At that time the students self-selected a partner with whom to work. These "learning pairs" then worked together for the rest of the term.

The structure of the classes was similar to that in Study 1. Each class period began with a brief lecture covering the concepts that would be illustrated in the problems for the day. Following the lecture, one to three textbook problems were assigned for the groups to complete. The groups also used the "designated writer" approach to achieve interdependence. Presentations did not take place on a daily basis, but only two or three times during the term. Solutions to the problems were handed out as each group problem was completed.

As an additional means of generating a cooperative learning environment, the case method was used in the last week of class to integrate the cost accounting concepts covered throughout the term. Each "learning pair" was assigned a case to present during the final week of class. The case presentations were graded on a number of criteria including content, completeness, professionalism, and use of visual aids. The grading structure and procedures, including the peer evaluation, were the same for this class as that described in Study 1.

Method for Empirical Investigation - Study 2

Students in this second classroom design were also asked for their perceptions of the group learning environment. Virtually the identical end-of-term survey was administered (n = 15). No objective measure of learning was obtained as no "control group" was available. Again, Likert scale responses were analyzed to determine if the perceptions of students in Study 2 were similar to those in the initial empirical study. Means, standard deviations and t-tests indicated that for all but a few of the statements, student perceptions in the two studies were not significantly different (could have come from the same population).

Results - Study 2

The junior/senior level cost accounting students in Study 2 reported positive attitudes and behavior toward learning, lending additional support to proposition 1. Similar to the students in Study 1, Study 2 students reported that the group format increased their learning, and that they preferred the group design over the traditional lecture form. They expressed a desire for the group format to be used in other classes. However, unlike the sophomore level Study 1 students, Study 2 students did not report that the group format resulted in greater attentiveness nor an increase in the amount of time that they studied. See Table 4 for specific scale items and their means, standard deviations, t-scores and p-values.

Study 2 responses also supported proposition 2. Study 2 respondents indicated that they enjoyed working in groups and believed that the group format had allowed them to get to know their classmates better. They also reported that the group processes enhanced their oral skills and that the "designated writer" led to an increase in interactions. They, too, agreed that explaining to others helped them learn, and that other group members had aided them in understanding the material. Similar to the results in Study 1, in-class group communication and interaction had not generated greater outside class interaction. Study 2 respondents did not prepare for class nor study for tests with their group members. (See Table 5 for details.)

Like Study 1 participants, Study 2 students perceived no ill effects from the group learning environment (P3). However, Study 2 respondents were somewhat stronger in their perceptions regarding the negative consequences of groups. They were neutral to the idea that some group members were a problem due to lack of preparation. They disagreed with the idea that they could cover up poor preparation through group membership or that dominating group members were a problem. They strongly disagreed with the statement "Some did all the work." Again, results suggest that peer evaluations may have proven to be a useful stick/carrot combination in reducing the social loafing, "nonpreparedness" problems. (See Table 6.)

MAJOR SIMILARITIES AND DIFFERENCES BETWEEN PERCEPTIONS OF STUDY 1 AND STUDY 2 STUDENTS

In a few instances, the mean response of Study 2 students differed significantly from Study 1 students (t-test for difference between two means, $p < .05$). Among the statements used to measure learning effects, means of the two groups differed on three items. Although Study 1 students agreed that the group format increased both their study time and their attentiveness, Study 2 respondents did not (Study 2 mean response of 2.867 and 2.733, respectively: 3 representing the neutral point.) However,

Study 2 students more strongly believed that the group format should be used in other classes (Study 2 mean = 1.667, Study 1 mean = 2.267).

In terms of communication/social interactions items, Study 2 mean responses were not significantly different from those of Study 1 save a single statement. Whereas Study 1 students were neutral about the skills-building effect of presentations, Study 2 respondents agreed that the presentations in the class did aid in developing their oral skills.

As mentioned previously concerning potential negative effects of group learning, the cost accounting students of Study 2 vehemently denied that some did all the work while the managerial accounting Study 1 students were neutral to the statement.

Interestingly, the two groups differed in their desires concerning the mechanics of group selection. The managerial accounting students indicated preference for teacher selection of groups while the cost accounting upperclassmen indicated they would prefer to choose their own members.

REASONS FOR DIFFERENCES OBSERVED

All in all the groups were quite consistent in their perceptions of the group learning environment and its effects. The few observed differences between the group mean responses suggest logical reasons for their existence.

First, regarding the difference between study time and attentiveness effects, Study 1 respondents were primarily sophomore level students who may still have been "learning the ropes" in study habits and listening/integrating skills. The Study 2 cost accounting students were upperclassmen whose study habits and skills were likely more advanced than those of the Study 1 underclassmen. This difference in years in

college may also explain the difference in preference regarding group composition. Due to their longer tenure in college, Study 2 students may have been better acquainted and knowledgeable of their fellow class members and therefore more interested in determining the composition of groups on their own. On the other hand, the less experienced underclassmen of Study 1 may have been unfamiliar with the others in their class, and, therefore, preferred that the instructor determine group membership.

The statements regarding class presentations are not directly comparable between the two studies. In the lower division managerial accounting course of Study 1, students were asked to present problem solutions in front of the class. In the upper division cost accounting class of Study 2, the students presented case analysis and solutions. The type of presentation asked of students apparently affected the perceived benefit to oral skills development. It is possible that the closer cooperative effort required of each member of the "learning pair" resulted in the reported higher skill development.

LIMITATIONS

The results of the empirical tests of effects of cooperative learning on collegiate accounting students suggest optimism about the pedagogical method. However, due to the exploratory nature of the studies, the results are subject to several limitations. Although two different courses and two sets of students attending two different institutions were used, the groups were quite small in size, therefore diminishing the generalizability of the results. In addition, the Study 1 "control group" was only comparable to the treatment group in a crude sense. Size of class, time of day and student composition were similar in only a rough way, and a different professor taught the control section. Additional research must be conducted to determine if the effects found here are indicative of effects that would be found if the cooperative method were used in other courses,

taught by other professors, and used at other institutions in teaching other groups of students (with their own idiosyncracies).

Although the results of Study 1 and Study 2 are similar, Study 2 is less a replication of Study 1 than an extension to a different arena. The two studies differed in several major ways: lower vs. upper division courses, regular semester term vs. abbreviated summer term, and U.S. vs. Canadian students. Study 2 therefore adds breadth to the application and sample. Studies of similar groups must be conducted in order to try to replicate the findings here.

CONCLUSION AND FUTURE RESEARCH

Business schools are coming under increasing criticism from the business community concerning the lack of student collaborative and interpersonal skills - skills mandatory in today's teamwork-oriented business environment. The Accounting Education Change Commission (1990) has also called for greater emphasis on teamwork, stressing the development of the skills involved in group interaction. Our studies represent an attempt to heed the Commissions's call and measure the results.

In these empirical studies, the students in two different accounting courses at two different institutions perceived positive learning effects. In one of the studies, evidence also suggests that greater objective learning may also be achieved by the cooperative learning classroom technique. Both groups of students reported that the cooperative format increased their communication and social interaction skills with little negative effect in terms of problem student group members. However, the primary author (the class instructor) observed problems with social loafing and hitchhikers in several of the groups from the lower division, managerial accounting class. These less-experienced students may have been hesitant to report negative behaviors of fellow group members on the evaluation instrument.

"Both groups of students reported that the cooperative format increased their communication and social interaction skills with little negative effect in terms of problem student group members."

Obviously, replications of these studies need to be conducted, using similar classes as well as additional courses, students and faculty at a variety of colleges. Rigorous control groups should be used in the future, utilizing random assignment of students if possible, while employing the same professor, homeworks and tests for both treatment and control groups. Such control group comparisons would indicate the incremental value of cooperative learning in augmenting objective knowledge and interpersonal skills development.

Use of a large number of students could also lead to improvement of the evaluation survey instrument. With a sufficient number of respondents, factor analysis could be conducted in order to generate an instrument that parsimoniously measures the students' perceptions regarding the various effects of cooperative learning. Better measures of negative group behaviors seem to be needed. Indeed, focus groups composed of student representatives of cooperative learning classrooms and traditional lecture format classes might provide some insight into how to improve measures of effects and point to additional effects that were not measured in this investigation.

Although our studies indicate that students in general will prefer the cooperative learning environment over the traditional competitive

environment, the two studies suggest that there may be significant differences in perceptions and effects based on size of group, major, student level (e.g., sophomore vs. senior) and collegiate institution. Research on the composition of the small learning groups also needs to be conducted. For example, should the groups' members be homophilous or heterophilous in terms of gender, major, and/or academic achievement (i.e., GPA)? Group composition may increase or decrease the learning of some or all members of the groups.

Finally, research on why and how cooperative learning increases student learning interactions would provide invaluable insight to all educators. We hope that these preliminary investigations into the effects of cooperative learning in collegiate accounting classes serve as an impetus to colleagues, and results in the test-use of this powerful technique in a variety of business classes.

TABLE 1

STUDY 1 - PROPOSITION 1 RESULTS

ITEM	MEAN	S.D.	t*	p
I learned a lot in this class.	1.667	.617	8.37	.000
I spend more time studying for this class because of the group format.	2.267	1.033	2.75	.007
Being part of a group increased my learning in this class.	1.933	.799	5.17	.000
Because I was a group member, I paid more attention in class.	2.067	.799	4.52	.000
Because I was a group member, I studied more than I intended.	2.533	1.060	1.71	.053
I believe the use of groups in this class added a great deal to my learning experience.	1.800	.862	5.39	.000
I would have learned more in this class if the professor had lectured more.	3.067	1.100	.24	.404
I have learned more in this class because of the group format than I would have learned if it had been a lecture class.	2.200	1.265	2.45	.013
Because I was part of a group, I prepared more for this class than I would have working individually.	2.067	1.033	3.50	.002
I felt pressured to work because I was in a group.	2.467	.743	2.77	.007
I would like to see the group format used in other classes.	2.267	1.163	2.44	.013
I prefer the group learning format to the traditional lecture format.	2.267	1.486	1.91	.037
Overall I enjoyed this class more than I thought I would.	2.200	.862	3.59	.001

Note: In all Tables, all items, Likert scale agree-disagree statements (1 = strongly agree, 5 = strongly disagree).

* Absolute value of Student t scores reported in all tables.

TABLE 2

STUDY 1 - PROPOSITION 2 RESULTS

ITEM	MEAN	S.D.	t	p
Outside of this class I studied by myself most of the time.	2.138	1.87	2.83	.006
I enjoyed working in groups.	2.067	.884	4.09	.000
Working in groups is like working in the real world.	2.643	.842	1.59	.066
Working in groups helped me develop oral communications skills.	2.400	1.056	2.20	.021
I usually studied for tests with members of my group.	3.667	1.234	2.09	.026
Working in groups lowered my anxiety level.	2.800	.941	.82	.284
Explaining concepts to other group members helped me learn.	1.467	.640	9.28	.000
Participating in presentations helped improve my oral communications skills.	3.000	1.000	0.00	.498
I usually did my homework with members of my group.	3.600	1.242	1.87	.040
Being part of a group made me more committed to this class.	2.533	.915	1.98	.032
Being part of a group helped me to apply the material in more of a "hands-on" way.	2.133	1.060	3.16	.003
I got to know my classmates better in this class than in other classes.	1.867	.640	6.86	.000
Other group members frequently helped me learn/understand the material.	2.067	.799	4.52	.000
Working in a group helped me to better apply the lecture topics.	2.200	.941	3.29	.002
Having a "designated writer" increased the interaction between group members.	2.267	.961	2.95	.005
Working in groups increased my sense of control in this class.	2.267	.704	4.03	.001
The group format made this class more fun.	1.933	.704	5.87	.000
The group format made this a better class than I had originally expected it to be.	2.200	.862	3.59	.001

TABLE 3

STUDY 1 - PROPOSITION 3 RESULTS

ITEM	MEAN	S.D.	t	p
I am responsible for my own learning.	1.533	.640	8.88	.000
I feel that unprepared members were a problem in my groups.	3.000	1.195	0.00	.498
Knowing that I would be evaluated by my peers made me work harder.	2.400	1.056	2.20	.021
I found I could cover up a lack of preparation because I was a member of a group.	3.333	1.047	1.23	.119
I feel that dominating members were a problem in my groups.	3.533	1.125	1.83	.043
Some group members did most of the work while others did next to nothing.	3.33	1.047	1.23	.119
The peer evaluation form was necessary because some of our grade was based on group work.	2.400	1.242	1.87	.040

TABLE 4

STUDY 2 - PROPOSITION 1 RESULTS

ITEM	MEAN	S.D.	t	p
I learned a lot in this class.	1.600	.632	8.58	.000
I spend more time studying for this class because of the group format.	2.867	.834	.62	.227*
Being part of a group increased my learning in this class.	2.267	.961	2.95	.005
Because I was a group member, I paid more attention in class.	2.733	1.033	1.00	.168*
Because I was a group member, I studied more than I intended.	3.000	1.000	0.00	.500
I believe the use of groups in this class added a great deal to my learning experience.	2.067	1.033	3.50	.002
I would have learned more in this class if the professor had lectured more.	3.533	.516	4.00	.001
I have learned more in this class because of the group format than I would have learned if it had been a lecture class.	2.267	1.163	2.44	.013
Because I was part of a group, I prepared more for this class than I would have working individually.	2.667	1.345	.96	.322
I felt pressured to work because I was in a group.	2.933	1.163	.22	.411
I would like to see the group format used in other classes.	1.667	.724	7.13	.000*
I prefer the group learning format to the traditional lecture format.	2.133	1.060	3.17	.004
Overall I enjoyed this class more than I thought I would.	1.667	.816	6.33	.000*

*Indicates significant difference between Study 1 & Study 2 mean responses.

TABLE 5

STUDY 2 - PROPOSITION 2 RESULTS

ITEM	MEAN	S.D.	t	p
Outside of this class I studied by myself most of the time.	1.667	1.234	4.18	.001
I enjoyed working in groups.	1.733	.884	5.55	.000
Working in groups helped me develop oral communication skills.	1.933	.779	5.17	.000
I usually studied for tests with members of my group.	3.933	1.223	2.96	.005
Working in groups lowered my anxiety level.	2.800	1.146	.68	.258
Explaining concepts to other group members helped me learn.	1.600	.507	10.70	.000
Participating in presentations helped improve my oral communications skills.	4.867	.915	4.80	.000*
I usually did my homework with members of my group.	3.400	1.352	1.15	.136
Being part of a group made me more committed to this class.	2.333	1.047	2.47	.013
Being part of a group helped me to apply the material in more of a "hands-on" way.	2.467	1.356	1.52	.074
I got to know my classmates better in this class than in other classes.	1.667	.900	5.74	.000
Other group members frequently helped me learn/understand the material.	1.800	.862	5.39	.000
Working in a group helped me to better apply the lecture topics.	2.600	1.298	1.19	.126
Having a "designated writer" increased the interaction between group members.	2.400	1.352	1.72	.053
Working in groups increased my sense of control in this class.	2.600	1.183	1.31	.105
The group format made this class more fun.	2.000	.845	4.58	.001
The group format made this a better class than I had originally expected it to be.	2.067	.884	4.09	.001

* Indicates significant difference between Study 1 & Study 2 mean responses.

TABLE 6

STUDY 2 - PROPOSITION 3 RESULTS

ITEM	MEAN	S.D.	t	p
I am responsible for my own learning.	1.200	.561	12.43	.000
I feel that unprepared members were a problem in my groups.	3.467	1.407	1.29	.109
Knowing that I would be evaluated by my peers made me work harder.	2.533	.834	2.17	.023
I found I could cover up a lack of preparation because I was a member of a group.	3.733	.884	3.21	.003
I feel that dominating members were a problem in my groups.	3.800	.862	3.59	.002
Some group members did most of the work while others did next to nothing.	4.067	1.100	3.76	001*
The peer evaluation form was necessary because some of our grade was based on group work.	2.000	.756	5.12	.000

*Indicates significant difference between Study 1 & Study 2 mean responses.

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