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Effects of Collaborative Learning on Test Scores of First Semester Nursing Students

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The project and manuscript have been successfully completed and meet the standards of the School of Nursing at San Jose State University. The project demonstrates the application of professional knowledge, clinical expertise, and scholarly thinking. An abstract of the project and two copies of the manuscript are attached.

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Please submit this form to the Graduate Coordinator. Attach the abstract, two copies of the manuscript, and documentation of submission to the journal.

Abstract

Thirty-two first-year nursing students enrolled in a first semester nursing fundamentals class at a local community college participated in a study that compared three test score grades between nursing students who studied with a partner(s) and those who studied alone. Four types of study groups were identified from a questionnaire by having students indicate whether they studied alone or with a partner(s) in preparation for each of the three tests. Test scores were matched with the student I.D. number and recorded. In this study, a one-way analysis of variance (ANOVA) was used to test the effect of studying together and studying alone. This analysis revealed no statistical difference in the average overall test scores among the four groups.

EFFECTS OF COLLABORATIVE LEARNING ON TEST SCORES OF FIRST SEMESTER NURSING STUDENTS

A Research Project

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The Faculty of the School of Nursing

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of the Requirements for

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by

Theresa Sue Rivera

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Abstract

Thirty-two first-year nursing students enrolled in a first semester nursing fundamentals class at a local community college participated in a study that compared three test score grades between nursing students who studied with a partner(s) and those who studied alone. Four types of study groups were identified from a questionnaire by having students indicate whether they studied alone or with a partner(s) in preparation for each of the three tests. Test scores were matched with the student I.D. number and recorded. In this study, a one-way analysis of variance (ANOVA) was used to test the effect of studying together and studying alone. This analysis revealed no statistical difference in the average overall test scores among the four groups.

Introduction

Research has shown the effectiveness of collaborative learning (Johnson & Johnson, 1993; Smith, 1993). Reviews from the Harvard Assessment Seminar (Light, 1990) report that students who study in small groups do better on tests than students studying alone. Essentially, collaborative learning occurs when small groups of students help each other to learn. Furthermore, related studies have shown that students who consistently utilize collaborative learning "are more satisfied with their learning experience than those exposed to traditional lecture method" (Yong, 1997, p. 1). Likewise, research has confirmed that pretest and posttest scores of students who studied collaboratively significantly surpassed those of students who studied individually (Gokhale, 1995).

Background and Significance

Extensive literature describes the effectiveness of collaborative learning. Slavin (1995) found that cooperative learning resulted in higher student achievement and enhanced students' self-esteem and social skills. Manarino-Leggett and Soloman (1989) described several different kinds of grouping alternatives associated with the concept of cooperative learning. Johnson and Johnson (1994) identified necessary components that made for successful group collaboration in terms of role clarification that promoted face-to-face interaction, group accountability, positive interdependence, and interpersonal and small group skills. Bruffee (1994) discussed the advantages of learning in a community over learning in isolation at the university level. Furthermore, Bruffee (1984) emphasized the importance of peer conversations as a

context that enabled students to relate what they know and extend their knowledge. For instance, Slavin (1995) suggests that high-level interactions within groups can be achieved for students of all ability levels if the goal of a collaborative group is for all the group members to learn. Webb, Troper, and Fall (1995) stated that students feel comfortable expressing their thoughts and can engage in high-level verbal interactions in their discussions, which may involve interchanges such as connecting prior knowledge to new information.

Even though extensive research supports the use of collaborative learning and study groups, the majority of research studies in collaborative learning have been done at the primary and secondary education levels. Also, most research in collaborative learning has been in nontechnical disciplines. Furthermore, fewer studies specifically focus on nursing students. An exception to this lack of empirical research was a study by Sipe (1997) that explored collaborative study among nursing students. The results of this investigation indicated that group work contributed to enhanced learning for nursing students.

Given this context, it was surprising that little research about collaborative learning among nursing students has been undertaken to date. Therefore, the purpose of this study was to compare the effects of individual study versus collaborative study in preparation for three unit tests among first semester nursing students. I compared four groups: (a) one in which students studied in groups for all three tests, (b) another in which students studied in groups prior to two tests, (c) a group that studied once before one of the tests, and (d) a control group that only studied alone. Participation

in a study group prior to taking a test was only considered to ascertain if studying alone or in a group affected test performance. I hypothesized that participation in a study group prior to a test would result in higher test performance over the control group in which students studied alone.

Method

Participants

Participants for this study were 32 first-year nursing students enrolled in a first semester nursing fundamentals course at a community college in northern California. Participants were asked to complete a survey developed specifically for this study. Participants were asked about how they studied prior to taking a test.

Design

A nonequivalent control group design was used in this study. Students chose their own group members. Also, group size was decided by students. The instrument used in this study was a questionnaire and was developed by the author. Five students studied alone. Eight students studied with a group once. Eleven students studied with a group twice. Eight students studied with a group three times. The profile of the study practices of the participants are listed in Table 1.

Table 1

Statistics for Groups Combined (N=32)

Type of Study Group

	Frequency	%	Valid %	Cumulative %
Studied alone	5	15.6	15.6	15.6
Studied with group once	8	25.0	25.0	40.6
Studied with group twice	11	34.4	34.4	75.0
Studied with group 3 times	8	25.0	25.0	100.0
Total	32	100.0	100.0	

Procedures

Approval to use human subjects in research was obtained from the San Jose State University Human Subjects-Institutional Review Board, and permission was granted to conduct the study by the Director of Nursing Education at the community college. Also, student participants were issued consent forms explaining the purpose of the research. Data were collected from a survey developed specifically for this study. The survey asked participants how they studied prior to taking a unit test. Test scores were collected from three test results. Students were allocated a number for identification, and this was used to track test scores. To preserve student confidentiality, each student was assigned a code number, which was designated by

the college. Code numbers were placed on tests and questionnaires. Completed questionnaires were submitted to the lecture instructor. Information was sealed in a manila envelope. All sensitive materials were kept in a locked safe. Hence, student confidentiality was maintained throughout the entire data collecting process.

Measures

Participation in a study group(s) prior to taking a test was assessed by reviewing student responses to a questionnaire. The questionnaire was administered after completion of unit tests. Four questions were on the participation outcome measure. Students were also asked to respond regarding their feelings about group participation.

Student performance was determined from points earned on unit tests. The grading scale was established by the School of Nursing as 90%-100%, an "A"; 80%-89%, a "B"; 70%-79%, a "C". Any grade value less than 70% was unsatisfactory.

Data Analysis

The data analyzed for this study were collected from responses completed in the survey and test score results. Traditional descriptive statistics including means and standard deviations were calculated by treatment (study group participation vs. nonstudy group participation). Units of analysis are reported by groups rather than individual participants.

A one-way analysis of variance (ANOVA) of average overall test score (dependent variable) by study group (independent variable) was conducted to analyze the different test results of four groups. Therefore, the degrees of freedom in the

ANOVA represented the total number of groups (4) rather than individual participants (32) being used as the unit of analysis.

Results

Table 2 presents the descriptive statistics, the mean scores, and standard deviations for participants in the four groups. The mean scores and standard deviation for the four groups are as follows: studied alone (M=42.20, SD=2.39); studied once in a group (M=35.25, SD=5.12); studied twice in a group (M=37.73, SD=3.98); and studied three times in a group (M=38.00, SD=4.75).

Table 2

One-way Analysis of Variance (ANOVA) of Average Overall Test Score (Dependent Variable) by Study Group (Independent Variable)

Average Overall Test Score

	N	Mean	Standard Deviation	Standard Error
Studied alone	5	42.20	2.39	1.07
Studied with group once	8	35.25	5.12	1.81
Studied with group twice	11	37.73	3.98	1.20
Studied with group 3 times	8	38.00	4.75	1.68
Total	32	37.88	4.65	.82

One-way analysis of variance of *F* test results for the four groups are presented in Table 3. There was no statistically significant difference in the average overall test score among the four groups.

Table 3

ANOVA

Average Overall Test Score

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	149.018	3	49.673	2.662	.067
Within groups	522.482	28	18.660		
Total	671.500	31			

Discussion

I hypothesized that students who studied with a group prior to taking a unit test would perform better than those who studied alone. My prediction was based on research advocating benefits of collaborative learning; that is, students who work in groups perform better. However, the statistical evidence gathered and analyzed from test results did not support my prediction. Although there was no significant statistical difference, it was shown that students who studied alone had a M = 42.20 score on all tests, which was slightly higher than any who studied in groups. One may account for the results by taking into consideration additional extraneous variables such as

students' educational achievement, academic honors, and class rank. A study completed by King (1991), likewise, found no statistical difference between students in peer study groups and those who studied alone. She explained that perhaps her results were affected by individual student academic competency. Furthermore, the questionnaire solely queried whether or not students studied in a group prior to a test. Students were not asked questions about how they selected their groups, the group composition, the number of times the group met, or for how long.

Students who studied alone offered some comments about why they preferred preparing for the examinations on their own. They mainly described disadvantages of group study, including time constraints and scheduling problems, and excess socializing ("too much chit chat"). However, future investigations might explore group performance in terms of how participants perceived benefits of group work based on students' verbal interaction, role assignments, gender, age, or ethnicity. Additionally, the researcher should have more contact with participants by interviewing participants which may provide further explanations of extraneous factors that perhaps influenced statistical findings.

Conclusions

This project demonstrated that students who studied alone performed as well or better on tests as students who studied in a group. Nevertheless, research has shown that collaborative learning provides opportunity for students to engage in academic dialogue, receive immediate feedback from peers, and promote enhanced social skills. Moreover, students tended to perform better on academic tasks/tests than those who

studied alone. Although the findings of this study do not find support found in much of the literature, it is recommended that a more in-depth examination of group characteristics and interviewing of participants occur before blanket application of these results. Students in nursing classes are often presented with long assignments of new material which require entailed memorization of isolated facts. Hence, even though students may not perform better on tests, which may be due to different academic competencies, they have the chance to converse with peers which may assist them in making sense of course material. Likewise, the benefits of collaborative work may not always be measurable, but this does not necessarily diminish the effectiveness of collaboration. Additionally, by explicitly encouraging collaborative learning and helping students organize study groups, teachers can furnish students with another study strategy.

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