

A Comparison Between Cooperative Learning and Traditional, Whole-class Methods— Teaching English in a Junior College*

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Abstract

The present study examines and compares Cooperative Learning (CL) techniques and the traditional whole-class method in terms of the English achievement of junior college students. Two freshman English classes participated in the study. The control class was taught using the whole-class, teacher-led method, and the experimental class was taught using CL. Evaluation of students' achievement was conducted by achievement tests administered before and after the experiment. T-test procedures were used to determine (a) whether the experimental class achieved higher overall scores than the control class, and (b) in which component(s) of the test the experimental class outscored the control class. The results reveal that students in small cooperative groups achieved significantly higher scores on the overall test and the cloze test component than those in the teacher-led learning environment. The achievement gains under CL are attributed to the method's reward structures and carefully structured interaction.

Key words: Cooperative Learning, STAD (Student Teams Achievement Division), EFL, TESOL

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INTRODUCTION

The present study examines Cooperative Learning (CL) techniques and compares them with the traditional, whole-class method in terms of students' academic achievement. Two factors motivate the study. First, traditional teacher-led instruction clearly does not promote the learning of all students. In fact, only 25-50 percent of the class may be listening to the teacher at a given time (Cohen, 1984). Second, students in the teacher-centered classroom play passive roles and wait for teachers to impart knowledge to them. Effective learning depends on the learners' constructing their own knowledge, not on knowledge recording or absorption.

For many decades, Cooperative Learning (CL) has been widely implemented to teach different school subjects, from science to music, because both theoretical arguments and research evidence support the contention that CL is an effective instructional approach. Studies comparing cooperative learning with individualistic or competitive learning indicate that CL promotes higher achievement than all forms of individualistic teacher-centered learning across all age levels and subject areas, and all tasks except perhaps rote and decoding kinds of tasks (Ghaith & Shaaban, 1995). However, little research has focused on the achievement of EFL learners. In order to determine whether CL techniques promote students' learning more than the traditional whole-class method does, two questions were asked in the study: 1) Do students in the CL setting exhibit higher overall achievement? 2) If CL techniques are effective, in what component of the test do students produce better achievement?

LITERATURE REVIEW

Olsen and Kagan (1992) define Cooperative Learning as "group learning activity organized so that learning is dependent on the socially structured exchange of information between learners in groups and in which each learner is held accountable for his or her own learning and is motivated to increase the learning of others." (Kessler, 1992, p.8). There are a variety of CL methods. According to Sharan (1980), these methods can be categorized into either Peer-Tutoring Methods or Cooperative Projects. At present, the methods teachers commonly use for Peer-Tutoring are DeVries' (1972) Teams-Games-Tournaments (TGT), Aronson's Jigsaw classroom (1978), Slavin's (1978) Student Teams Achievement Division (STAD) and the Johnsons' Learning Together (1986), while the common Cooperative Projects are Sharan and Sharan's Group Investigation (1976) and Kagan's Co-op Co-op (1985).

Simply put, CL refers to a set of instructional methods in which students work together in small, mixed-ability learning groups. The groups typically have 4 members and include high-, medium- and low-achieving students. A number of studies show CL to be particularly valuable for medium- and low-achieving students with regard to academic improvement (Skon, Johnson & Johnson, 1981). Some teachers suggest that the better performance of low-achieving students is bought at the expense of the high-achieving students, and that the high-achieving students could learn more if they were not stuck tutoring. However, in their meta-analysis of sixty-five peer-tutoring studies, Cohen and Kulik (1981) found that 87 percent of studies indicate that participants in the tutoring process, both tutors and those tutored, produced better academic performance and achievement than control students. Students benefited both by teaching and by being taught by other students.

Specialists in language education insist that cooperation and group work are effective means of promoting learning due to the greater social and linguistic interaction (Brown, 1994; Nunan, 1992). Researchers conclude that the advantages of CL can be analyzed in terms of both linguistic and psychological benefits (Cohen & Tellez, 1994; Christison, 1990; MaGroary, 1989;). Doughty & Pica (1986) claim that the linguistic benefits include those gained from small group work in which task structures ensure the positive involvement of all group members. Long and Porter (1985) maintain that carefully structured interaction between students contributes to gains in second language learning. Johnson, et al. (1981) note that psychological health benefits associated with CL settings, such as lower anxiety levels and improved motivation, are positively related to achievement and productivity.

In foreign/second language classrooms, three different CL methods have been utilized to increase students' academic achievement. In Bejarano's (1987) study, Student Teams Achievement Division (STAD) and Discussion Group (DG) were compared with the traditional whole-class method. The findings reveal that both CL methods registered significantly greater improvement than the whole-class method on an overall test and on a listening comprehension scale. Wang (1992) applied another CL technique, Learning Together, to teach grammar. Again, learners in the CL group outperformed those in the whole-class group. Learning Together is a framework for using CL at any grade level with any subject. Students work in heterogeneous groups to complete a common worksheet. The teacher's primary in-class emphasis is on monitoring and clarifying tasks or teaching collaboration skills.

As for the two small-group cooperative techniques implemented in Bejarano's study, Discussion Group (DG) is designed to provide students with broad and diverse learning experience. Research has revealed that DG is particularly effective in increasing higher level cognitive abilities among students (Kagan, 1995). On the other hand, Student Teams Achievement Division (STAD) is an ideal framework when the goal is mastery of content and has been shown by research to increase student achievement (Sharan, 1980; Johnson & Johnson, 1993). STAD is based on fostering students' motivation for learning by focusing on cooperation between the members of different teams. Unlike Group Investigation and Learning Together, STAD emphasizes team rewards (group scoring) which accounts for achievement gains (Slavin, 1983). For these reasons, STAD was chosen as the Cooperative Learning framework for the study.

A growing number of studies have reported on CL use in Taiwan (e.g. Chane & Kuo, 1995; Tseng, 1996; Wei, 1997). However, only two were found which used STAD. One is a qualitative interview study exploring how junior-college-level students perceived the changes in their language and social development (Chen, 1998). The other provides comprehensive information about the application of STAD at a vocational high school (Lin, 1995). Since neither of them examines the impact of STAD on student achievement, research is needed to explore the issue. For this paper, students learning English through STAD were compared with those in the traditional whole-class setting to assess the effect of STAD on students' English achievement.

METHODOLOGY

Subjects

Two freshman English classes from Kang Ning Junior College of Nursing participated in the study. The control class contained 48 nursing students and the experimental group contained 49 nursing students. The same instructor (the investigator) taught both of the classes.

Instruments

An investigator-made achievement test was given twice, one before the experiment and one after (midterm and final exams, respectively). Thus, certain areas of language functioning and the changes occurring during the experimental period could be noted. The test consisted of four components: three discrete-point tests (grammar, vocabulary and reading) and an integrative test (cloze). Discrete point tests were constructed on the assumption that language can be broken down into its component parts and those parts adequately tested (Brown, 1994). However, Oller (1979) argues that language is a unified set of interacting abilities that cannot be separated and tested adequately. Dictation and cloze tests are the prime examples of integrative tests. In particular, Oller claims that cloze test results are good measures of overall proficiency.

A cloze test is a reading passage in which roughly every sixth or seventh word has been replaced by a blank; the test taker is required to fill in the blanks with appropriate words. There are a variety of formats for cloze tests. Four types of cloze tests used frequently in language testing are fixed-ratio, rational cloze, multiple-choice cloze and C-test. The rational cloze allows the test writer to select the words or other elements to be deleted. It was instituted for the achievement test of the study so as to measure a number of abilities. The reading passages for the rational cloze test were drawn from articles in the textbook series *Beyond 2000*, by Nicholas Sampson, and paraphrased by the investigator. The rational cloze test focused on knowledge of vocabulary, grammatical structure and discourse structure, reading skills and strategies (see Appendix). The cloze test usually follows either of two scoring methods. One requires the test taker to supply the exact word that is deleted and the other is to supply any acceptable word. The latter procedure was chosen as the scoring method.

Discrete-point test items attempted to test students' language ability component by component. For the vocabulary component, the test taker was required to spell out the tested words. The aim of the multiple-choice reading comprehension test was to assess the ability to use two explicitly taught reading skills: scanning and reading for exact information. As for the multiple-choice grammar test, it measured mastery of important grammatical points. The investigator and another English teacher graded both pre-test and post-test to ensure reliable scoring.

Procedures

Freshman English was a four-credit-hour, required course that met for two hours, twice weekly for 50 minutes. The experiment was conducted for two months, from mid-November 1998 to mid-January 1999 (i.e., from the midterm exam of the fall semester of 1998 to the end of the semester). The control class was instructed in a traditional whole-class method with the teacher lecturing during the whole class

period. A quiz consisting of vocabulary in context, sentence combining or cloze test, reading comprehension and dictation was given at the end of each unit. Four quizzes were given during this study.

The experimental class was instructed using the STAD approach. STAD, a peer-tutoring technique, calls for the creation of long-term learning teams of students who help each other master material. Team members are tested individually and then scores are compared to a baseline score. Student team scores are computed based on individual scores and improvement points are given. STAD always has the following steps: (1) Organization of small heterogeneous groups, (2) Presentation, (3) Group practice, (4) individual testing, and (5) Group recognition.

Organization of Small Heterogeneous Groups. A list of students' base scores was made for the experimental class, ranked from highest to lowest student. Base scores were the average of four different quiz scores (Quiz1-Quiz4) prior to the midterm exam. The first team was composed of the highest one, the lowest one and the middle two students in the class, according to their base score. The second team was formed with the second highest, second lowest and the middle 3rd and 4th students, and so on. The heterogeneity of these teams, each with four or five students of mixed levels, was meant to offer the greatest chances for peer tutoring. For the most part, high-achieving students played the role of tutors and low-achieving students were the tutees. Students were asked to decide on their group names and their leaders and were given their personal base scores.

Presentation. The teacher read vocabulary and a story to present each lesson.

Group Practice. Two Kagan cooperative structures-Within-Team Jigsaw and Number Heads Together-were utilized in sequence to ensure individual accountability and equal participation. Within-Team Jigsaw was used as a preview technique. Each student was responsible for looking up certain words in a dictionary at home and becoming an expert in those words for their group. Then, students shared around the team orally. Later, Number Heads Together was used as a review technique. Number Heads Together follows four steps: (1) Students number off, (2) Teacher asks questions, (3) Students put their heads together, and (4) Teacher calls a number.

To ensure that students followed CL structures, the investigator joined one team at least 5 minutes once per week. The investigator listened to how students explained the texts and ideas and how students responded to the information. When common difficulties were observed, the teacher provided additional explanations to the whole class.

Individual Testing. The experimental class took the same quiz given to the control class at the end of each of for units.

Group Recognition. Students were told to calculate their individual improvement scores by comparing their quiz scores with their base scores. The guidelines for determining improvement points are as follows (Kagan, 1995):

<u>Quiz Score</u>	<u>Improvement Score</u>	<u>Comment</u>
5 or more below base	0	"You can do better!"
4 below to 4 above base	1	"About average for you--but you can do better"
5-9 above base	2	"Better than your average--good work"
10 or more above base or perfect score	3	"Super! Much better than your average !"
★ 95 to 99 points never receive less than 2 Improvement Points 100 always receives 3 Improvement Points		

After every two quizzes, students recomputed their base scores by averaging the old base score and the scores on quizzes since assigning the last base. An example would look like this:

$$(\text{Old Base} + \text{Last Quiz} + \text{Next-to last quiz}) \div 3$$

<u>Improvement Scoring Role Book</u>										
<u>Name</u>	<u>Base</u>	<u>Quiz 5</u>	<u>IP</u>	<u>Q6</u>	<u>IP</u>	<u>Base</u>	<u>Q7</u>	<u>IP</u>	<u>Q8</u>	<u>IP</u>
Sandy	79	83	1	90	2	84				
Helen	81	58	0							
Linda	60	72	3							
Amy	94	100	3							
Total			7							

Individual improvement scores were accumulated to determine group scores. Grades were utilized as the group reward. Teams that had the top three improvement scores in the class would be given 3 extra bonus points to their final grades of the semester.

The Class Thermometer was utilized as class reward. The investigator first recorded some class celebrations, for example, cassette free time and watching videos, on the class thermometer. Students marked their improvement points on it, which recorded progress toward class goals. When the class reached a celebration point, the celebration was rewarded to students.

RESULTS AND DISCUSSION

Two-tailed *t*-test results for the pretest (midterm exam) indicated that the control class and the experimental class did not differ significantly in the total score or the scores of the four test components: TOTAL, $t(47) = 1.790$, $p = .080$, VOCABULARY, $t(47) = 1.675$, $p = .101$, CLOZE, $t(47) = 1.387$, $p = .172$, GRAMMAR, $t(47) = .478$, $p = .635$, READING, $t(47) = 1.856$, $p = .070$.

Table 1 presents, for both classes, the means and the standard deviations of each component of the achievement test separately (vocabulary, cloze, grammar and reading) together with the mean and standard deviation of the whole test (total).

TABLE 1
Descriptive Statistics for Performance of Students
in the Two Teaching Situations

Scale (range of scores)	Cooperative Condition (n = 49)	Whole-class Condition (n = 48)
Total		
<i>M</i>	74.23	68.46
<i>SD</i>	12.28	10.44
Vocabulary (5-20)		
<i>M</i>	15.46	14.27
<i>SD</i>	4.62	4.36
Cloze (6-20)		
<i>M</i>	17.52	13.85
<i>SD</i>	2.98	3.89
Grammar (12-36)		
<i>M</i>	26.92	25.42
<i>SD</i>	5.96	5.23
Reading(6-20)		
<i>M</i>	14.33	14.92
<i>SD</i>	2.78	2.58

To analyze the differences in performance using these two instructional methods, two-tailed *t* tests were run to determine (a) whether the experimental class achieved higher scores than the control class on overall achievement, and (b) in which component of the test the experimental class outscored the control class. The results are as follows:

1. Students in the cooperative learning class outperformed those in the traditional teacher-led class on the total test, $t(47) = 2.911$, $p = .005$ ($p < .01$), and on the cloze, $t(47) = 5.816$, $p = .000$ ($p < .001$).

2. No significant differences between the two classes were found for vocabulary, grammar and reading test scores.

These results suggest that the CL method enhances overall achievement and cloze achievement compared with the traditional whole-class method.

DISCUSSION

The Effects of Cooperative Learning on General Achievement

The theory on which cooperative learning is based is a theory of incentive structures. In the present study, the Group Recognition portion of STAD functions as the motivator. It provides two incentive structures—group rewards and class

rewards. Students responded very well to the Recognition Bulletin Board and the Class Thermometer. STAD allows all students and teams an equal opportunity for success, since recognition is based on gains. For example, a team member who has a base score of 58 and a quiz score of 68 contributes as much to the group as a member who has a base score of 80 and a quiz score of 90. In order to maximize their group scoring, students are not only motivated to increase their own achievement but also the achievement of others. Tutoring is likely to help students pursue better team performance.

Peer tutoring functioned effectively in the study. Many high-achieving students were observed tutoring their teammates, especially working on the test items when getting quiz sheets back. Through tutoring, peer tutors obtained a more in-depth understanding and made gains in their own language proficiency. Tutored students profited from "kid language" translated from the teacher's language by their peer tutors. For example, some low-achieving students had difficulty understanding the teacher's lecturing because their basic grammar ability was limited. Peer tutors always taught or reviewed these concepts for tutees. Krashen (1981) reported that students prefer to listen to their friends rather than to the teacher. Students worked together and helped each other toward earning team rewards. This is in accordance with the conclusion drawn by Slavin (1983). He declares that without group rewards, there is little reason for team members to care about their teammates' learning.

The two Kagan's structures utilized in the Group Practice portion also appeared to foster academic achievement. Within-Team Jigsaw required students to preview their own assignment before each class meeting. In other words, they were forced to prepare beforehand, and then actively participate and explain ideas to teammates during group discussion. Better understanding and retention was an obvious effect. Hence, greater improvement on the quizzes by pupils in the CL setting, compared to those in conventional classroom, was shown consistently as the study proceeded.

The results of two previous studies could probably explain why Within-Team Jigsaw had a positive impact on students' learning. In Chen's (1998) study, one participant said she had benefited greatly from Within-Team Jigsaw. She reported that "With the frequent use of the dictionary, I not only enlarged my vocabulary but also acquired a better feel for sound-spelling relationships." Wei (1997) investigated college learners' perceptions of the Jigsaw technique. Some participants believed they sometimes learned extra grammar and related knowledge.

As students sometimes might make mistakes in terms of the meaning of words and sentence structures when doing Within-Team Jigsaw, the teacher needed to do a quick review so as to check for understanding. In general, the traditional method for teachers to do a review is Whole-Class Question and Answer. That is, the teacher asks a question and then calls on a student who raises a hand. According to Kagan (1995), Whole-Class Question and Answer often boils down a conversation between the teacher and the high achievers while the rest of the class is between semi-interested and totally indifferent. By contrast, Number Heads Together was a very powerful review technique. Students were constantly attentive because they knew that their number might be called. They practiced as much as they could to ensure that everyone in the group knew the answer. Most of them were able to explain answers when called. If a student gave a partially correct response, the teacher would call another one with the same number to add to that response. The opportunities for being called were much greater as compared to Whole-Class

Question and Answer. The improved academic achievement might have been facilitated by the increased frequency of practice.

Students benefited from the different types of interaction CL offers because second language acquisition is a highly interactive and collaborative process. The reward structure stimulates student-student helping and tutoring to increase their own learning as well as others'. In sum, carefully structured interaction and the inclusion of a reward structure seem to contribute to the academic gains observed in the study.

The Effect of Cooperative Learning on Cloze Test and Discrete Points

The finding that CL attained superior results on the cloze appears to be in line with Ghaith and Shaaban's (1995) view. They conclude that CL is more effective in promoting higher achievement than all forms of teacher-centered learning across all age levels, subject areas and all tasks except perhaps rote and decoding kinds of tasks. Discrete point tests focus on assessing only one skill (e.g., speaking, listening, reading and writing), or only one English component at a time (e.g., vocabulary, grammar, reading for specific purposes). The vocabulary test in the study can be considered to be a rote task, since it requires examinees to spell out the tested words. As the multiple-choice grammar component assessed the ability to identify the correct grammatical rules or grammatical structures, it can be considered to be a decoding task. Likewise, the multiple-reading comprehension tested two reading skills, scanning and reading for exact information.

Integrative tests, on the other hand, examine the student's ability to use many skills simultaneously when accomplishing a task. To supply appropriate words in blanks for the cloze test, an examinee needs to be equipped with language competence in different areas such as knowledge of vocabulary, grammatical and discourse structure, and reading strategy. Interaction in small groups probably had its immediate effect on integrative skills. Teaching their assignment to peers provided learners with opportunities to practice linguistic structures taught formally and also acquire structures not taught formally. In addition, it allowed learners to integrate their different English abilities or language skills, which may explain the results obtained by the CL group.

CONCLUSIONS AND RECOMMENDATIONS

The results obtained in the study indicate that students in small cooperative groups gained significantly higher achievement on the total test and the cloze test than those in a teacher-led learning environment. These results are consistent with the view that the basic requirements of effective language teaching are reward structures and carefully structured interaction. Cooperative Learning is based on theories of motivation. Both group rewards and class rewards motivate learners to perform better themselves and to increase the academic gains of their teammates. Through carefully structured interaction, students are offered a greater quantity and variety of second language practice. Furthermore, interaction encourages learners to actively participate in discussions and to be involved in their learning rather than passively wait for the teacher to bestow knowledge on them. As learners' language development and cognitive development are enhanced, their academic achievement improves.

Based on the theoretical principles underlying this research and the findings reported here, the use of cooperative, small-group learning is highly recommended for teaching the large English classes found in Taiwan. The key recommendation for English teachers who want to implement the CL approach in their classrooms is to organize the heterogeneous teams with students of mixed levels. This will offer the greatest chances for peer tutoring and support.

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APPENDIX

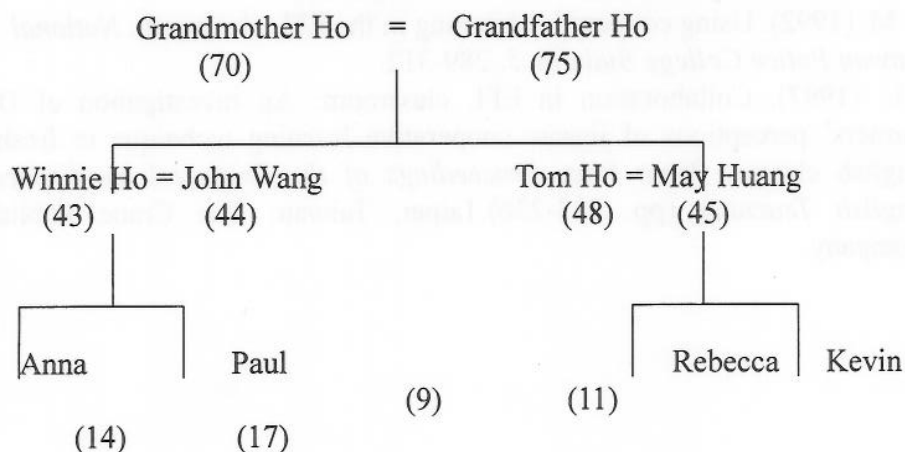
CLOZE A

Robots help us a lot in our daily life. In the past, most of the robots were used in 1 to help workers do work faster. Now, a new robot is invented and can be used at home. It is a special robot 2 Metal Mickey. Mental Mickey is very clever. He has a big computer memory 3 knows many things about science, language, history and geography.

Mental Mickey can help 4 with their homework. But he will not do your homework for you. He will only help you to do it. There are different buttons for different 5 on the front of his chest. Mental Mickey does not speak. He only 6.

Do you want to know how Metal Mickey can help? Well, imagine that you have to do a class project on America. You press the 'History' button and 7 'America, please.' Soon, different topics on America appear on the screen. You then choose a topic, such as 'people' and say 'Print, please.' Metal Mickey then prints out all the information he has on the people of America. 8 so easy! However, you must be 9 to him. If you forget 10 say 'please' or 'thank you', he will not help you.

CLOZE B



There are ten people in the Ho family. Grandmother Ho is 70 years old and her 1 is 75 years old. They have two children 2 both have children of their own.

Winnie is a nurse and John is a doctor. They work in a 3. They go to work 4 bus every day. Winnie has two children-one boy and one girl. The boy 5 called Paul and the girl's name is Anna. Both of them are 6 school students.

Tom is Winnie's 7 brother and his wife is May. Tom is a 8 who delivers letters. He works for the post office. Tom also has two children-Rebecca and Kevin. Rebecca is 9 than Kevin and she has 10 cousins.

合作學習對五專生 英語學習的影響*

陳琇娟*

摘要

本研究旨在比較「合作學習」和傳統的「演講式教學法」對五專一年級學生在英語學習的影響。本研究係以學生得分(後測-前測)平均來考驗實驗組和控制組學生的學習成效是否有差異。研究發現實驗組的學生有較高的學習成效(總分、克漏字二方面得分優於控制組、且達統計之顯著差異);而合作學習教學的兩大策略:酬賞結構和嚴謹的互動練習則對學生的學習成效學生有正向的影響。

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「附錄」

目錄

王德勝醫師主編之「附錄」，內容豐富，涵蓋了許多重要的醫學知識，對於醫學界人士來說，無疑是一份寶貴的參考資料。本「附錄」共分五大部分，分別為：一、醫學史；二、醫學倫理；三、醫學教育；四、醫學研究；五、醫學實踐。每一部分都經過精心編纂，力求做到內容充實、條理清晰、易於理解。希望這份「附錄」能為廣大醫學從業人員提供有益的參考和啟發。