

The Effect of Cooperative Learning in Enhancing “Drill-and-Practise and Critical-Thinking Skills” Among the Low Competent Students

Khairunisa Nikman¹, Ngo Kea Leng²

¹Academy of Language Studies, Universiti Teknologi MARA, Pahang, Malaysia

²Academy of Language Studies, Universiti Teknologi MARA, Terengganu, Malaysia

Received: June 11, 2017

Accepted: October 7, 2017

ABSTRACT

There are countless approaches that can be engaged by lecturers to enhance students' learning. Cooperative Learning (CL) is one of the approaches that can encourage social interaction and promote active learning among the students at the same time. CL is able to provide opportunities for students to work together and learn from each other in order to achieve common learning goals. This paper studies the effectiveness of cooperative learning in enhancing students' learning skills. A hypothesis is proposed that there is a significant difference between individual learning group (control group) and cooperative learning group (experimental group) for students' development of critical thinking skills. Pre-experimental design is used and the data are collected from 40 students from a university in Pahang. Findings obtained reveal that there is a significant difference between the control group and the experimental group for the skills mentioned earlier. The findings are hoped to encourage lecturers to promote CL in classroom teaching in order to better help the students, especially the low competent ones to achieve learning goals in the classroom.

KEYWORDS: Students' Learning, Cooperative Learning, Individual Learning, Critical Thinking.

INTRODUCTION

In line with practicing communicative language teaching (CLT) to enhance learners' ability to acquire language, cooperative learning (CL) which is also known as collaborative learning has received renewed interests since the past decades. The use of cooperative learning approaches has become an alternative to better help the students, especially the low competent ones to achieve learning goals in the classroom [5]. In [5] points that “the belief about learning is that cooperative behaviour is stimulating not only socially but also intellectually, and hence that tasks requiring social interaction will stimulate learning”.

There are several developers of cooperative learning theory, yet the most well-known ones would include Robert Slavin, Roger and David Johnson and Spencer Kagan [6]. They have also introduced several structures or approaches to cooperative learning, for example, Slavin is associated with Student Team Achievement Division (STAD) while in Kagan develops a structural approach [7].

LITERATURE REVIEW

What is Cooperative Learning?

In practical term, Slavin; Sharan et al (as cited in Nunan, 1992) define cooperative learning as “students working together to achieve common learning goals” [6]. The social interactions involved could be as simple as having the students in pairs to discuss a reading text or assigning them in groups to complete a project paper. Each team member is responsible not only for his or her own learning of what is taught but also in helping other teammates to learn, thus creating a better learning environment. All members of the team work together on the assigned task until everybody successfully understands and completes it. According to Wang (2001), “cooperative learning is a system of teaching strategy which promotes the students in cooperating in a heterogeneous group towards a common goal and are rewarded according to the success of the group” [8].

Table 1 provides a summary of differences between individual and cooperative learning, as claimed by Kohonen (1992) [4].

Table 1: Individual learning versus cooperative learning [4]

Individual Learning	Cooperative Learning
<ul style="list-style-type: none">• Students work alone on their own sets of materials.• Students work at their own speed.• Achievements are evaluated on a criterion-referenced basis.• Students perceive that their achievement is unrelated to what other students do.	<ul style="list-style-type: none">• Learners work together to accomplish shared goals.• Students are motivated to work together.• Achievements are evaluated on a criterion-referenced basis.• Positive interdependence among learners.

Does Cooperative Learning Really Work?

Johnson & Johnson; Johnson et al & Slavin (as cited in Biehler & Snowman, 1997) agree that “cooperative-learning methods have proven effective in increasing motivation for learning and self-esteem, redirecting attributes for success and failure, fostering positive feelings towards classmates, increasing performances on tests of comprehension, reasoning and problem solving” [3]. There are several benefits which students are able to gain such as benefits on motivation, achievement and social relationship when they have mastered some aspects of cooperative learning and are comfortable working with their peer’s experience.

1. Benefits on motivation: Cooperative learning supports learners to be more motivated in their learning. Slavin (as cited in Biehler & Snowman, 1997) found that “cooperative learning produced bigger increase in some aspects of self-esteem than the noncooperative method with which it was compared” [3]. As the students work together in the group, the help received from the more competent learners would make the weaker learners to be more motivated to accomplish the task assigned to them.
2. Benefits on achievement: Many researches have shown that cooperative learning techniques promote student learning and higher academic achievement. Slavin (as cited in Biehler & Snowman, 1997) found that in several studies, “students in cooperative-learning groups scored about one-fourth of a standard deviation higher on achievement test than did students taught conventionally” [3].
3. Benefits on social relationship: Students would also develop skills in oral communication, as well as the interpersonal skills and responsibility. The learners would become closer to the other group members as they work together to accomplish certain goals. Biehler states that “in some students the relationships that were formed were deemed to be quite strong” [3].

The purpose for this study is to examine the effectiveness of cooperative learning namely group work, in enhancing students’ drill-and-practice skills and critical-thinking skills. In order to explore the significance of individual and group scores for the items tested, the researcher posited the following research question: There is a significant difference between individual learning group and cooperative learning group for students’ development of critical thinking skills.

METHODOLOGY

This research employs a quasi-experimental design, which is the static group comparison design. Two groups of sample were formed. The group that received treatment was compared with the group that did not receive treatment. A convenient sampling was done and the sample was chosen from two groups of students in Applied Science Faculty, enrolled in the English for Academic Purposes (BEL311) course. A total of 40 students participated in this study with 26 participants were females and 14 were males. The participants were then randomly divided into two groups; control group and experimental group.

In the experimental group, the participants were then assigned to ten smaller groups with two students per group. This group size was selected because according to [4], “cooperative learning teams are deliberately heterogeneous and consist of two or four members”. On the other, in the control group, the participants were expected to work individually.

Initially, the researcher delivered the same instructions to both groups. Then, the participants were given two reading texts and a worksheet. The researcher explained that the participants needed to read the texts and later worked on the worksheet. The worksheet contained one question where the participants needed to write an essay on a given topic by summarising, paraphrasing and synthesising information from the two given passages. 20 participants were randomly assigned to the individual learning group (control group), while the other 20 subjects were assigned to cooperative learning group (experimental group). The two groups worked simultaneously in separate classrooms and they are given 1 hour and 30 minutes to complete the task.

In the individual learning group which was the control group, the researcher repeated the instructions to the students. The students then worked on the reading texts by themselves at their own pace. Then, the students were asked to work individually on the worksheet. The students were given one hour and 30 minutes to work on the task.

For the cooperative learning group (experimental group), the reading texts was divided between the members of each group and each participant in the group would read and understand his or her own section. They were also asked to summarise and paraphrase the information from the texts that would later be used in the essay. Later, they would regroup and share their reading with their partners in the group. Aronson et al (as cited in Olsen & Kagan, 1992) identified this structure as Jigsaw 1, the original variation of Jigsaw structure as it “assigns different materials to students” [7]. The group members then worked together on the same worksheet as given to the control group.

The reading texts used in this study were adapted from the past semester final examination paper for English for Academic Purposes (BEL311) course. The post-test (the worksheet) was designed to measure students’ understanding on the text and their ability to analyse, synthesise and incorporate relevant information

from various secondary sources. According to [1], the items belonged to the knowledge, comprehension and application classification of Bloom's Taxonomy were categorised as 'drill-and-practice' items and the items that belonged to synthesis, analysis and evaluation classifications of Bloom's Taxonomy were categorised as 'critical-thinking items'. The task given to the students involved the domains of comprehension (summarise and paraphrase the information), analysis (analyse the information) and synthesis (synthesise and incorporate the relevant information in the essay). Therefore, this task applied both 'drill-and-practice' and 'critical thinking' skills.

The Statistical Package for the Social Sciences (SPSS version 22.0 for Windows) was utilized to analyse the quantitative data gathered from the worksheet. The statistical analysis method included the use of frequency distribution tables of the variables on the worksheet to get an overall picture of how the participants responded to the question. To further support the quantitative data, this study also gathered qualitative data through written comments given by the participants of experimental group on their learning experience.

RESULTS AND DISCUSSION

In order to identify students' performance in the post-test, descriptive statistics was used. The means and standard deviation (SD) of both control and experimental groups were compared. The post-test ratings of both groups were also analysed and tested against a significance test of $p < 0.05$ to determine if the means of both groups were significantly different. Meanwhile, the qualitative data gathered through the written comments were analysed using hand analysis. Findings for the main data set were shown in Table 2.

Table 2: Comparison of means and SD of students' scores of the post-test.

Sample	Subject (n)	Mean	SD
Individual learning group (control group)	20	11.60	1.56
Cooperative learning group (experimental group)	20	17.45	1.43

Table 2 shows the descriptive statistics of students' scores of the post-test. The mean score for individual learning group that is the control group was 11.60 as compared to the cooperative learning group (experimental group) which scored 17.45. The standard deviation (SD) of the experimental group also showed smaller value (1.43) than the standard deviation of the control group (1.56). This showed that the standard deviation of experimental group is better than the control group. Hence, to determine whether there was a significant difference between both groups' scores, independent samples t-test was applied.

However, before the t-test could be applied, test of normality had to be done by using Kolmogorov Sminov Normality Test. Significant result with $p > 0.05$ must be achieved to show that all data were normal. Table 3 shows the findings of the normality test.

Table 3: Test of normality

Method	p-value	Normal Distribution
	Kolmogorov Sminov	
Cooperative learning group	0.014	No
Individual learning group	0.108	Yes

From the findings in Table 3, it could be seen that the data was not normally distributed for all variables. Since the normality test was not achieved, the independent sample t-test could not be applied. Therefore, the nonparametric Wilcoxon Signed Rank Test had to be run to compare the mean scores for both control and experimental groups. The findings can be seen in Table 4.

Table 4: Scores of students' performance of the post-test

Paired Test	z-Value	p-Value (<0.05)	Significance
individual ~ cooperative	-5.265	0.000	Yes

Based on the result, the findings indicated that the result was significant, as z-value is -5.265 and $p < 0.05$. Therefore, it could be said that there is a significant difference in post-test marks between individual learning and cooperative learning groups.

Discussion of the Findings

According to the statistical analysis of the test scores, it was found that the experimental group, which was the cooperative learning group had scored significantly better than the control group or the individual learning

group items. Since p-value is less than 0.05, there is a significant difference between the two variables. Therefore, the hypothesis is accepted.

Vygotsky (as cited in Gokhale, 1995) points that “students are capable of performing at higher intellectual levels when asked to work in collaborative situations than when asked to work individually” [2]. In cooperative learning group, learners are encouraged to help each other in explaining and mastering certain topic or ideas. Gradually, the slow learners would benefit from the interaction and improve their achievement in the task/test given. Stevens, Madden, Slavin and Farnish (as cited in Nunan, 1992) found that “students working in cooperative groups significantly outperformed those receiving traditional instruction on standardized measures of reading comprehension, reading vocabulary, language mechanics, language expression and spelling” [6].

The cooperative learning group was also asked to write short written comments on their learning experience. The comments were divided into three categories: 1) The benefits on the process of cooperative learning, 2) The benefits on the social and emotional aspects, and 3) The negative aspects of cooperative learning. Most of the subjects felt that cooperative learning helped them to better understand the text and to complete the task ahead of them. More also commented that this approach made them closer to their friends and helped them to be more confident to accomplish the goal. Four subjects mentioned that they wasted a lot of time in doing the task as they argued a lot on the ideas. The comments, along with the number of participants who made those comments were described in Table 5.

Table 5: Descriptions of students’ comments regarding cooperative learning

A. The benefits on the process of cooperative learning			
Comments (# of responses)			
Better understanding (14)			
Contribution of ideas (4)			
Working together in a group (13)			
Work done easily (9)			
B. The benefits on the social and emotional aspects			
Comments (# of responses)			
Close relationship with friends (6)			
Help others to understand (13)			
Become more open-minded (2)			
Feel more confident (8)			
Communication with others (2)			
Fun (9)			
C. The negative aspects of cooperative learning.			
Comments (# of responses)			
Takes longer time than working individually (5)			
Arguments on ideas (9)			
No response (9)			
No negative aspect (17)			

CONCLUSION AND RECOMMENDATIONS

From the quantitative analysis of this study, it can be concluded that cooperative learning does enhance students’ development of critical-thinking skills in completing the task assigned to them. This can be seen from the analysis that cooperative learning group performed significantly better than the individual learning group. The written comments also revealed that the participants too viewed cooperative learning as helpful to enhance critical-thinking skill. Therefore, if the purpose of the instruction is to promote critical-thinking ability, the cooperative learning approach would be the most effective approach.

Several suggestions have been made if a study of this nature is to be carried out in the future. As for the future research, it is suggested that the researcher could investigate the effects of different variables in the cooperative learning process for instance the researcher could look at the different group composition

(heterogeneous versus homogenous), group selection and size, structure of cooperative learning and preferences for cooperative learning associated to gender and ethnicity.

REFERENCES

1. Bloom, B. S. (1984). Taxonomy of educational objectives, Handbook 1: The cognitive domain. Addison Wesley Publishing Company.
2. Gokhale, A. A. (1995). Collaborative Learning Enhances Critical Thinking. *Journal of Technological Education*, 7 (1): 22-30.
3. Biehler, R. & Snowman, J. (1997). Psychology applied to teaching. Retrieved from <https://college.cengage.com/education/pbl/tc/coop.html>
4. Kohonen, V. (1992). Experiential language learning: Second language learning as cooperative learner education. In: *Collaborative Language Learning and Teaching* (Nunan, D. (1992) pp. 14-39. Cambridge University Press, New York.
5. Miller, C.K. & Peterson, R. L. (2003). Creating a positive climate. Retrieved from http://www.indiana.edu/~safesch/cooperative_learning.pdf.
6. Nunan, D. (1992). *Collaborative language learning and teaching*. Cambridge University Press.
7. Olsen, R. E. W-B. & S. Kagan, (1992). About cooperative learning. In: *Cooperative Language Learning: A Teacher's Resource Book* (ed C. Kessler) pp. 1-30. Prentice Hall, New Jersey.
8. Wang, T. (2001). *Cooperative learning-Theory and strategy*. Xueyuan Publishing House.