

Jigsaw Cooperative Learning: A Viable Teaching-Learning Strategy?

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Abstract

This study focused on investigating the effect of jigsaw cooperative learning instruction on the second-year undergraduates' achievement of Teaching Learning Strategy. Undergraduates' opinions about jigsaw cooperative learning instruction were also investigated. The participants of this study were 52 second-year undergraduates in Islamic education department in Islamic University of Jakarta, Indonesia. A pre-test was applied to both experimental (N=28) and control groups (N=24) before the treatment in order to identify undergraduates' prior knowledge about "Teaching Learning Strategy" and to determine if there was a significant change in Teaching Learning Strategy from pre-test to post-test for second-year undergraduates. Independent t-test was conducted to compare the prior knowledge test scores for groups and no significant difference was found in terms of mean scores. After the instruction, post-test was administered to investigate undergraduates' achievement. The results showed that students in the experimental group, who perceived their instruction as more cooperative and more student-centered, had significantly greater improvement on achievement measures than did the students in the control group. In addition, individual interviews reflected that undergraduates had positive opinion about jigsaw, and they believed jigsaw is an effective cooperative learning technique that promotes positive attitudes and interest develop inter-personal skills. The major findings of this study support the effectiveness of jigsaw learning for students in Indonesia higher education institutions.

Keywords: Jigsaw, cooperative learning, teaching learning strategy, achievement

1. Introduction

Instructional process in Indonesia is done by many educators today are likely to target curriculum materials, more emphasis on memorization rather than understanding concepts. It can be seen from the learning activities in the classroom that is always dominated by the teacher. In the delivery of content, typically teachers use the lecture method, where students just sit down, take notes, and listen to what it conveys and fewer opportunities for students to ask questions. Thus, to be non-conducive learning environment so that students become passive.

Efforts to increase student achievement is inseparable from the various factors that influence it. In this case, it takes a creative teacher who can make learning more interesting and favored by learners. Classroom atmosphere needs to be planned and constructed in such a way by using appropriate learning model for students to have the opportunity to interact with each other so that in turn can be obtained optimal learning achievement.

For institutions that scored a teacher, or the Faculty of Teacher Training and Education, this is a big job to change the teacher candidates to become teachers who will be creative in presenting the lesson. Prospective teachers should be completely prepared with a variety of teaching strategies or methods that will be employed the learning in their daily work. Especially in the course of teaching learning strategies, students should be given a variety of teaching strategies that they can later use and modification according to the conditions they face in the field. For the student must be directly involved in using a variety of teaching strategies so, they can feel the advantages and shortcomings of the teaching strategies that eventually gained from the experience, they will be able to choose the learning steps that really fit with the characteristics of a given field of study or the characteristics of the students they teach. So that, the learning objectives will be achieved with effective and can simultaneously explore optimal potential in their students.

This study uses a jigsaw cooperative learning teaching strategies, to introduce and involve students directly in its activities, so that students experience and have experience of how to use the jigsaw strategy of cooperative learning in teaching.

2. Literature Review

Jigsaw cooperative learning is a learning strategy that promote students motivation in learning, positive attitude and develop interpersonal skills and enrich students achievement. This strategy was developed by Elliot Aronson (1971) with his students from Texas University and California University. Jigsaw is a strategy that emphasizes cooperative learning by providing students an opportunity to actively help each other build comprehension. Use this strategy to assign students to reading groups composed of varying skill levels. Each group member is responsible for becoming an "expert" on one section of the assigned material and then "teaching" it to the other members of the team Aronson, E. (2000-2008). Furthermore in Hedeem, Davis (1993:147) states that in small group work and cooperative learning, student learn best when they are actively involved in the process. Researchers report that, regardless of the subject matter, student working in small groups tend to learn more of what is taught and retain it longer than when the same content is presented in other instructional formats (Hedeem 2003: 325-332).

2.1 Benefits

In connectionwiththe large number ofstudents andthe materialthatwillbe taughtinthis course, then researcher choose thejigsaw cooperative learning strategyin learning activities. According to Aronson and Goody (1980) Jigsaw is a well-established method for encouraging group sharing and learning of specific content. This technique can be used as an instructional activity across several days and is best to use when there is a large amount of content to teach.

Doing jigsaw cooperative learning strategy in learning activities, there are several advantages, as Tamah (2007) states, "Students are encouraged to learn from their fellow students in their expert team and when they go back to their home team they are encouraged to teach one another the material they have worked on in the expert team" (p. 13) which describes exactly how the jigsaw approach should work in a classroom. This approach sounds ideas for teacher because it allows the students to be actively engaged in teaching one another. The jigsaw also allows the teacher to be a facilitator, nor a director in the classroom, which is a trend in schools today.

As Efe and Efe (2010) analyzed how students assigned as group leaders in the jigsaw helped motivate the rest of the group. Result suggested that when given the title of "group leader" students worked to motivate other students to complete their work. It means that, this activity allows students to experience learning and contribute to their learning. According to Mengduo and Xiaoling in Crist (2012) The jigsaw classroom reduces students' reluctance and anxiety to participate in the classroom activities while increasing self-esteem and self-confidence: (p. 122). As well as Aronson and Patnoe (2011) state jigsaw has proved effective at raising the self-esteem of students while improving their performance and increasing their liking for school and their enthusiasm about learning.

In addition to helping students learn new material. The jigsaw helps build social skills. Anderson and Palmer (2001) reports that the jigsaw approach is backed by research showing it to motivate students to work together, share ideas, pursue common goals, and develop self-esteem. The jigsaw cooperative learning also provides a way to help students become active in classroom activities and/ or lessons. When students are anxious or sometimes even afraid to contribute, they are going to miss information that is needed to fully understand the material. The jigsaw allows students to work with one another and develop a sense of being needed. By involving in the activities, the students focus on listening, speaking, co-operation, reflection, and problem-solving skills.

2.2 The Steps That Used for Jigsaw

When using the jigsaw technique in the classroom, there some steps should follow as below: Information about this strategy is from the Muskingum Area Technical College (Zanesville, Ohio) Newsletter, September 14, 1994.

- Define the group project on which the class will be working.
- Randomly break the class into groups of 4-5 students each, depending on the size of the class, and assign a number (1 to 4-5) to students in each group.
- Assign each student/number a topic in which he/she will become an expert.
- The topics could be related facets of a general content theme.

- Rearrange the students into expert groups based on their assigned numbers and topics.
- Provide the experts with the materials and resources necessary to learn about their topics.
- The experts should be given the opportunity to obtain knowledge through reading, research and discussion.
- Reassemble the original groups.
- Experts then teach what they have learned to the rest of the group.
- Take turns until all experts have presented their new material.
- Groups present results to the entire class, or they may participate in some assessment activity.

3. The Study

3.1 Research Question and Hypothesis

The present study tries to investigate the effect of jigsaw cooperative learning instruction on the second-year undergraduates' achievement of Teaching Learning Strategy. To do this, the researchers intend to do the procedure taken for the study reported below, based on the aim of the study, the following question was raised:

What are the mean percentage scores of students taught Teaching Learning Strategy using jigsaw cooperative learning strategy and those taught using group discussion strategy.

To provide more objective answer to the question, the following null hypothesis was formulated to be tested out: There will be no significant difference between the achievement of students taught Teaching Learning Strategy using jigsaw cooperative learning strategy and that of those taught using group discussion strategy based on their mean percentage scores in Teaching Learning Strategy achievement test.

3.2 Participants

A total of 52 second-year undergraduates in Islamic education department participated in this study, since all the participant are homogenize and the number of those participant are less than 100, so the number of population the same as the number of the sample (Sugiono: 2009). They consisted of 28 participants for experimental group and 24 participants as control group.

3.3 Research design

This study Used Quasi-experimental research design. This method was used because in this study all subjects are naturally formed as an intact group, as a group of students in one class (Shandish at al. 2002). The pre-test and post-test were given to the two groups and further details are showed in the following figure.

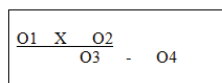


Figure 1. Research Design

- O1 = Pre-test of experimental group
- O2 = Post-test of experimental group
- O3 = Pre-test of control group
- O4 = Post-test of control group
- X = Treatment
- = No treatment

3.4 Instrument

The instrument to measure students' achievement is in the form of multiple choices test. First, the researchers wrote about 10 test items for each topic to be piloted. The achievement test refers to each topic of the lesson. There were 9 topics all, so, the total number of test item initially is 90.

3.5 Pilot Study

Pilot of the achievement test was administered to 50 students from other class that have already been taught the topics. The validity of the achievement test items were examined by using the correlation Product Moment. From 90 test items, there were 4 items were not valid, so 86 items were used in this research for the achievement test. The Kuder Richardson's 20 (KR 20) method was used to examine the reliability of the test items. The result of the detailed data analysis is shown in table 1.

Table 1. The Kuder Richardson Coefficient of reliability of instrument used to measure student achievement

Topics	Item Numbers	KR-20 coefficient
01	10	0.71
02	9	0.61
03	10	0.80
04	8	0.72
05	10	0.66
06	10	0.74
07	10	0.67
08	9	0.69
09	10	0.65

Table 1. Shows the Kuder Richardson Coefficient of reliability of instrument used to measure student achievement is 0.69. The results indicate that instrument used to measure students' achievement have high internal consistency.

3.6 Experimental Procedure

The purpose of this experimental procedure is to explain how the experiments that were carried out in the classroom. The pre-test was given one day before the treatment while the post-test (achievement test) was given when the treatment process ended. The experiment (treatment) was held for six weeks (from the third week of February to the first week of April 2013). The nine topics of the lessons were given to the two groups (experimental group and control group). The experimental group was given a treatment with jigsaw cooperative learning strategy while the control group with group discussion strategy.

3.7 Data Collection Procedure

When the class have been determined in two classes as experimental class and control class. The pre-test was given before the class begin. The experimental class received lessons with jigsaw cooperative learning strategy, while the control class received lessons with the group discussion strategy. Post-test was given when the experiment ended. The score for each (experimental group and control group) was taken from the result of the post-test.

3.8 Technique of Data Analysis

In this study the examination of the effect of jigsaw cooperative learning strategy on students' achievement is done by comparing the average students achievement's score in different groups. Data of the study is analyzed using t-test. Before the treatment, both experiment and control groups were given the pre-test to identify undergraduates 'prior knowledge about " Teaching Learning Strategy" The result detailed shows in the following table.

Table 2. Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	t	df
Pre-test				50
Equal variances not assumed			-.508	47.184

The table above shows t-test statistic revealed that t-critical (1.96) is greater than t-calculated (-0.51) at 0.05 of significance. This means that the prior knowledge of Teaching Learning Strategy for both groups is no significance difference.

4. Results

The results of the study are presented on the table below. Research questions : What are the mean percentage scores of students taught Teaching Learning Strategy using jigsaw cooperative learning strategy and those taught using group discussion strategy

Table 3. Mean percentage scores of students in experimental and control groups.

Group		N	Mean	Std. Deviation	Std. Error Mean
Post-test	Experimental	28	81.36	2.360	.446
	control	24	76.46	3.575	.730

The results of mean percentage scores of students in experimental and control groups (table 3) shows that students taught with jigsaw cooperative learning strategy had percentage mean score of 81.36, those taught using group discussion strategy had percentage mean score of 76.46. The experimental group therefore performed better than the control group.

5. Hypothesis

There will be no significant difference between the achievement of students taught Teaching Learning Strategy using jigsaw cooperative learning strategy and that of those taught using group discussion strategy based on their mean percentage scores in Teaching Learning Strategy achievement test.

Table 4. t-test analysis

Teaching Strategy	Mean	SD	N	staff	std	t-cal	t-crit	decision
jigsaw cooperative learning strategy	81.36	.829	28	50	2.360	5.907	1.960	Reject H ₀₁
group discussion strategy	76.46	.855	24					

Based on information presented in table 4. The t-test statistics revealed that t-calculated (5.907) is greater than the t-critical (1.960) at 0.05 level of significance, the null hypothesis is therefore rejected. This means that the students Teaching Learning Strategy using jigsaw cooperative learning strategy perform better achievement than those taught using group discussion strategy.

6. Discussion

The finding of research question 1 revealed that the jigsaw cooperative learning strategy has significant main effect on second-year undergraduates achievement in Teaching Learning Strategy. The jigsaw cooperative learning strategy may be most effective by mid to late semester (see NISE 2005), especially in large classes.

Finding in Hypothesis showed that there is significant difference between the mean achievement scores of students taught with jigsaw cooperative learning strategy than those taught using group discussion strategy. The findings are in line with Aronson (2000-2013) stated jigsaw classes showed greater academic improvement; poorer students in the jigsaw classroom scored significantly higher on objective exams than comparable students in traditional classes.

7. Recommendations

By the conduct of this research, the researcher recommend that:

For Institution, Jigsaw cooperative learning strategy should be given to under graduates students in the subject of

Teaching Learning Strategy to enrich their experience before conducting their real classroom.

For government, Training or workshops opportunities about Jigsaw cooperative learning strategy should be made available to teachers.

8. Conclusion

By using a jigsaw cooperative learning in teaching and learning activities, the students' attention is more focused, and they can express the ideas they had in mind. For students who are shy, using the jigsaw cooperative learning will automatically respond to all assigned tasks, so they will issue their opinions more active, and they can also listen to the opinion of their friends and respond it immediately. Furthermore, students' confidence will show up and can also appreciate other opinion. For the group leader, the soft skills to work in groups will be honed, so by using cooperative learning jigsaw, it is not just improve academic achievement but self-confidence, listening skills and respect other people's opinions will be trained as well.

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