

Effects of Jigsaw Learning Method on Students' Self-Efficacy and Motivation to Learn

Dwi Nur Rachmah

Department of Psychology, Faculty of Medicine,
Universitas Lambung Mangkurat, Banjarmasin, Indonesia
E-mail: dwi_nurrachmah@yahoo.co.id

Abstract

Jigsaw learning as a cooperative learning method, according to the results of some studies, can improve academic skills, social competence, behavior in learning, and motivation to learn. However, in some other studies, there are different findings regarding the effect of jigsaw learning method on self-efficacy. The purpose of this study is to examine the effects of jigsaw learning method on self-efficacy and motivation to learn in psychology students at the Faculty of Medicine, Universitas Lambung Mangkurat. The method used in the study is the experimental method using one group pre-test and post-test design. The results of the measurements before and after the use of jigsaw learning method were compared using paired samples t-test. The results showed that there is a difference in students' self-efficacy and motivation to learn before and after subjected to the treatments; therefore, it can be said that jigsaw learning method had significant effects on self-efficacy and motivation to learn. The application of jigsaw learning model in a classroom with large number of students was the discussion of this study.

Keywords: Jigsaw learning method, self-efficacy, motivation to learn

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Introduction

A teacher has an essential role in making the university teaching and learning process effective and beneficial for the psychological condition of the students. Good teachers are expected to be aware of their teaching-learning process's effectiveness in improving their students' academic achievement and psychological condition as well as helping them succeed in understanding the taught materials. One of the learning processes that is considered useful in fostering students' independence in learning, known for having many positive effects on the psychological condition of the learners, is the Cooperative Learning approach. Johnson (1986) stated that cooperative learning method helps learners acquire critical thinking skills because it creates a situation where learners must explain, discuss various perspectives, and have a greater understanding of the material they learn. In cooperative learning, the learners need elaborative thinking to exchange information.

The results of previous studies, such a study done by Moskowitz, Malvin, Schaeffer, and Schaps (1985) showed that cooperative learning had an impact on the development of academic and social competence. It is also concluded in other recent studies that cooperative learning with jigsaw technique affected the academic achievement of students at the University of Nigeria (Mari and Gumel, 2014), and contributed to motivation and cognitive activities (Hanse and Berger, 2007). Although some previous studies showed positive impacts of cooperative learning on a person's behavior, it seemed that cooperative learning did not necessarily bring a significant impact on one's psychological condition, namely perceived self-efficacy. In contrary, Şengül and Katranci (2014) found that cooperative learning with jigsaw method, applied to students through experimental measurements of pre-test and post-test, showed no significant difference in the level of perceived self-efficacy in mathematics. This result was also consistent with the study conducted by Mari and Gumel (2014); in addition to examining the differences in student achievements between the students applying jigsaw cooperative learning method and traditional method, they also examined the differences of self-efficacy. The results of the study on self-efficacy did not reveal any difference based on the two learning methods.

Differences in the results of previous studies, especially on the psychological condition of students such as self-efficacy in the application of jigsaw learning technique, require reexamination especially for the Department of Psychology, the Faculty of Medicine, Lambung Mangkurat University in seeking for a model for effective learning in a large class of more than 30 students as the first step to prepare for the implementation of competency-based curriculum (CBC). Jigsaw learning method is a new method new and has never been done in previous lecturing processes at the Department of Psychology so a study to test the effectiveness of jigsaw learning method as the foundation for further learning process is required, especially since students' self-efficacy and motivation to learn because cannot be separated.

Bandura (1997) defined self-efficacy as a person's belief in his/her capacity to organize and implement measures to achieve set goals and assess the level and strength in all activities and contexts. Self-efficacy, as defined by Friedman and Schustack (2008), is an important cognitive element described as the expectation or belief (hope) about how much a person

can perform a behavior in each situation. A positive self-efficacy is the belief of being able to perform the behavior. In the absence of self-efficacy which is a very situational belief, someone may have no desire to perform a behavior. It indicates that self-efficacy has a close relationship with one's motivation to learn. Pintrich and Schunk (1996) defined motivation as the process whereby goal-directed activity is instigated and sustained.

Method

Subjects for this study were 81 first semester students in the Department of Psychology, Faculty of Medicine, Universitas Lambung Mangkurat, who took General Psychology in the first semester. There were three variables in this study, namely (1) jigsaw learning method (2) self-efficacy, a person's belief in his ability to understand lessons and pass the exam, and (3) motivation to learn, the motivation to learn the material of General Psychology.

The methods used to collect data were the self-efficacy and motivation to learn scale. The design of the study was the experiment using one group pretest and posttest design. At the first meeting, we informed the students that there would be a group discussion during the ninth meeting (after midterms). Students were divided into seven groups of 12 to 13 people per group. Before the study, the subjects were measured for self-efficacy and motivation to learn during the ninth meeting. The study was also carried out by giving a treatment, applying the jigsaw model of cooperative learning, to the groups of the study subjects. After this jigsaw learning model was applied for seven meetings, at the fifteenth meeting (final class meeting), the subject was given the scales again to measure their self-efficacy and motivation to learn. The scores of subjects' self-efficacy and motivation to learn that were obtained from the two measurements were compared and tested for the differences. Data were analyzed using the paired samples t-test.

Self-efficacy scale was arranged on the aspects of magnitude, generality, and strength based on Bandura (1997). Meanwhile, motivation to learn scale was based on the aspects stated by McCown, Driscoll, & Roop (1995), consisting of the desire and initiative to learn, involvement in assignment completion, and commitment to continue learning. Scale trials were conducted among 29 third semester students in the Department of Psychology. The

scales were self-efficacy scale consisting of 35 items with a correlation coefficient ranging between 0.357 to 0.773 and reliability coefficient of 0.947, and motivation to learn scale consisting of 30 items with a correlation coefficient ranging between 0.300 up to 0.703 and reliability coefficient of 0.912.

At the beginning of this study, we divided students into home groups. One student from each home groups was then selected to be a member of the expert groups, namely the groups discussing the schools in psychology consisting of group one to seven. These expert groups discussed the schools of structuralism, functionalism, gestalt, psychoanalysis, behaviorism, cognitive, and humanism, respectively. The division of the groups was held at the first meeting by a random drawing. Each member of the expert groups was then asked to study the material and prepare an individual presentation, scheduled the midterms. Members of the expert groups would present their knowledge on the material related to their expert group to their original home group. The students were asked to actively discuss and ask the things important to them. After the discussion, the teacher provided feedback to develop students' common perception and conducted a quiz as an evaluation of the learning process on that day. The students were also given the opportunity to provide an assessment to the members of the expert groups who explained the materials to them on the day as the consideration for teacher assessment. The procedures for jigsaw learning model were conducted for seven meetings with different materials. At the last meeting (the fifteenth meeting), the 81 respondents were measured for their self-efficacy and motivation to learn with the same scales.

Results

Measurements results of the subjects' self-efficacy and motivation to learn before and after the experiment were compared and tested to determine the difference with paired samples t-test. The results of the self-efficacy variable analysis by comparing pre-test and post-test scores showed the t value -3,170 with $p = 0.002$ ($p < 0.05$, one-tailed). These results indicated that jigsaw learning method significantly increased self-efficacy. The results of the motivation-to-learn variable analysis by comparing pre-test and post-test scores showed the t value of -2,158 with $p = 0.034$ ($p < 0.05$), indicating that jigsaw learning method very significantly increased motivation to learn.

In addition to examining the effects of jigsaw learning method, the researcher also studied the relationship between self-efficacy and motivation to learn. The results of data analysis showed a correlation between self-efficacy and motivation-to-learn by 0.624 with a significance level less than 0.05. Description of the findings is listed in Table 1.

Table 1
Statistical description of pre-test and post-test data

Variable		Mean	SD	t	Sig. (2-tailed)	N
Self-efficacy	Pre-test	110.93	11.409	-3,170	0.002	81
	Post-test	114.74	12.987			81
Motivation to learn	Pre-test	95.47	7.948	-2,158	0.034	81
	Post-test	97.81	9.069			81

Discussion

Studies on self-efficacy have widely been carried out, such as the difference between self-concept and self-efficacy (Bong and Schaalvik, 2003), self-efficacy as a mediator in the relationship between self-oriented perfectionism and academic procrastination (Seo, 2008), and effects of competition on students' self-efficacy in vicarious learning (Chan and Lam, 2008). Studies on motivation have also been carried out, such as the relationship between motivation and academic achievement (Eppler and Harju, 1997), and Academic Motivation in Self-Efficacy, Task Value, Achievement Goal Orientations, and Attributional Beliefs (Bong, 2004). However, the studies on the relation of self-efficacy to the use of jigsaw learning method are diverse with inconsistent results. The study conducted by Araban, Zainalipour, Saad, Javdan, Sezide, and Sajjadi (2012) showed that jigsaw learning method augured well for self-efficacy while the studies conducted by Şengül and Katranci (2014) and Mari and Gumel (2014) showed the opposite results.

Those studies become the basis and additional evidence that self-efficacy and motivation to learn can be influenced significantly (< 0.005) by jigsaw model of cooperative learning. The researcher also performed a correlation analysis on the variables of self-efficacy and motivation to learn because the relationship between the variables cannot be separated in

shaping the behavior of students. This is in line with Hergenhahn (2010) who stated, “people who consider their capability pretty high will try harder, achieve more, and be more persistent in performing tasks compared to those who consider their capability low”. Results of Pearson correlation test in this study indicated a relationship between self-efficacy and motivation to learn of psychology students.

The success self-efficacy and motivation to learn testing lay in the correct procedures of jigsaw learning model. However, there was a step, the forming of groups consisting of 5-6 persons for each, which could not be met because of the number of the psychology students in one class. This is proof that jigsaw learning method can also be applied to a class with large number of members in each discussion group. The other key to the success of the jigsaw learning process in affecting self-efficacy and motivation to learn was due to the quiz at the end of the lectures, as described by Aronson (2008). He believed that the last step in the use of jigsaw learning model was the need for a quiz or test to avoid making the students feel that their efforts were in vain. The students not only had discussions within the expert groups but also received feedback and evaluation after the discussion process was completed. The members of the expert groups were also assessed by the members of their home groups for their efforts in describing and explaining the schools in philosophy. The selected students in the expert groups would try to understand and explain the materials to their home group properly, and the other students as the participants in the discussion would also try to achieve good evaluation of learning outcomes. This effort is called motivation to learn, to be the basis of increasing their self-efficacy.

The average values of the increasing points earned by self-efficacy (3.81) and motivation to learn (2.34) seemingly had something to do with the limitation of this study, namely the large number of students engaged in jigsaw learning model. Bigger classes and too many members of each group could interfere with the discussion activity, and as a result, not all students in the home groups were actively involved in the discussion. Remeasurement of the variables of self-efficacy and motivation to learn in further studies is required to see the consistency of both variables after the application of jigsaw learning model ends, and the traditional learning model is reapplied.

Conclusion

This study adds to the evidence that Jigsaw teaching methods can improve students' self-efficacy and motivation in college. This method can also increase the students' knowledge and competence, both in a small as well as large sized classroom. This study also have a limitation that should consider of. Further study need to examine other intervention that predicted influence the self-efficacy and motivation.

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