

THE EFFECT OF COOPERATIVE LEARNING ON FATHANAH CHARACTER AND STUDENT ACHIEVEMENT IN CHEMISTRY

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Abstract

This study was aimed to investigate the effect of cooperative learning on fathanah character and student achievement in chemistry. This study used experimental method. The subjects were the students of the chemistry department of FMIPA UII that taking course of organic compounds structure elucidation in the 2012/2013 academic year. The instruments used were achievement test and fathanah questionnaire. Independent sample t-test statistic tool was used to analyze the data collected. The results of the test indicated that cooperative learning have significant effect on student achievement, but do not have a significant effect on fathanah character.

Keywords: *cooperative learning, fathanah character, student achievement in chemistry*

Introduction

Courses of Organic compound structure elucidation explain the use of spectroscopy aspects to identify the cluster functions and determine the chemical structure of a chemical compound organic matter. Materials of the courses were on the basics instrumentation: Spectroscopy, Ultraviolet-Visible, Infrared (IR), Nuclear Magnetic Resonance (NMR), Mass Spectra (MS) data interpretation and organic compound structure elucidation technique. The learning achievement of this course is still low. In this course students are expected to be able to read, interpret, and combine the spectral data given by instrumentations. Even though, it was being an effort to make students active. The class' activity is dominated only of students who have high achievement. The activity viewed from a how far they are actively asking or answering questions. To stimulate student activity, often lecturer is trying to appoint a passive students to answer the questions.

Besides academic achievement-oriented performance, the chemistry department of the Islamic University of Indonesia also seeks to equip students with character education. One character is a college student who needs is fathanah (Arabic) character. Fathanah is a character full of intelligence, professionalism, competence. According to Adz-Dzakiey (2004), fathanah character can be developed using methods such as: 1) build effective communication with sincerity of heart, with the language and media that it is easier to understand, communicate the needed and important thing, 2) build the ability to solve problems with quick, accurate, logical, 3) awareness-raising, 4) the ability to create positive change. It was assumed that cooperative learning can give positive influence to develop fathanah character. In the cooperative learning students who have learning experience can build effective communication, look for problem solving, and build intelligence social.

According to Slavin (2000), cooperative learning not only aimed to improve learning achievement. But also to increase internal locus of control, intergroup relations, self-esteem, pro-academic norms. Cooperative Learning is done with forming of the distribution student groups. Unlike in conventional learning, which is often the working and activity groups determine only by a few students. Cooperative learning requires a responsibility of the individual to be able to achieve objectives of the group. Without the responsibility of each individual, group goals to get a higher learning achievement will not be achieved. This was because group work was considered from the performance all members of the group. To get the achievements, each member of the group must have academic attitudes. Students are required to be fathanah character in performing their tasks and studying in the group.

Many studies showed a positive impact of cooperative learning in the achievements cognitive and social skills (Dorney, 1997; Peklaj, 1999; Doymus, et al, 2009; Hanze, 2007; Yasemin, et al 2010). In the cooperative learning classroom, the students are expected to help each other, to discuss, argued to increase their knowledge (Dikici and Yavuzer, 2006). It is expected that cooperative learning can improve the student achievements and fathanah character.

Method

This study uses an experimental research method with a quantitative approach. This study will see how far effect of cooperative learning on the student achievement and on the fathanah character. In this research, students are divided into 2, first cooperative learning as experimental class and second group is conventional learning as

control classes. Cooperative learning is used by NHT (Numbered Head Together) and STAD (Student Teams Achievement Divisions) type. The samples are students who take courses in organic compounds structure elucidation, in the academic year of 2012-2013.

The research instrument used are: 1) achievement test, 2) a questionnaire measuring of fathanah character. The research instrument was conducted in two phases, the preparation and testing phase. Achievement test instrument using descriptions query according course structure elucidation of organic compounds curriculum's. Fatahanah inquiry developed from indicators: 1) problem solving, 2) willingness to learn from others, 3) ability to resolve the problem based on knowledge, 4) self-management and group management skills. Students give answers by choosing one of the answer that has been provided. The scoring of questionnaires affective and internal locus of control used scale of 1 to 4.

In the preparation phase, instruments are designed and consulted to expert, and then tested to determine the validity and reliability of the instrument. From the test results, the validity and reliability of the instrument are high.

In the testing phase, learning session in the control classes as well as trial classes was conducted over 7 week periods. At the end of lesson, student achievement and fathanah character were measured in each class. Statistical calculation is then performed to determine whether there is a difference of the two classes. Significance level (alpha level) used in the study was 0.05. All statistical analysis was carried out by SPSS 15 software.

This method begins with cooperative learning groups based on the distribution of heterogeneous academic ability in each group. Each class was conducted with cooperative learning approach NHT and STAD.

NHT basically is a variant of Group Discussions, but there is only one of the students who represent groups but had not been told who will be grouped representatives. This ensures total involvement of all students (Slavin, 2000). At the first, students were divided into groups, which consists of 5 people. Each member of the group was given number from 1 to 5. Lecturer provides questions or cases, students think together to unite their opinion to answer the questions and make sure that all members of the group understood the answer. Lecturer called for a certain number, a student from each group which has the number to answer the question for the whole class. The score achievement of the group depends on the answer of group members who are called. Each member group to makes sure to understand matter.

STAD model consists of five main components, namely the class presentations, team, quiz, individual score progress, team recognition (Slavin, 2000). Learning started with an explanation matter by lecturers. Lecturer provides the opportunity students discussing in groups. The discussion was to discuss questions lecturers and the most important thing is to ensure each member can do a quiz with good. Afterwards, student held a quiz individually. Quiz scores obtained by the students, is the average score of the group. This forced the students to active learning and understood the material, because they have a moral responsibility to the member group.

Result

Table 1 presents t-test results, chemistry student achievement of control classes and experimental classes. Analysis of the test obtained by sig value is less than 0.05, it means that there is huge differences significantly to their scores chemistry between control classes and and experimental classes. Average score in the experimental classes was 81.83, while the control classes was 64.17.

Tabel 1. Independent Sampel Test of Learning Achievement

		Levene's test for equality of variances		t-test for equality of means						
				t	df	Sig. (2 tailed)	Mean difference	Std. Error difference	95% confidence interval of the difference	
		F	Sig.						lower	upper
score	Equal variances assumed	3,367	0,096	2,300	10	,044	17,667	7,680	,555	34,780
	Equal variances not assumed			2,300	7,565	,052	-17,667	7,680	-,223	35,557

Table 2 presents t-test results, fathanah character score of control classes and experimental classes. The results of analysis obtained by sig value is more than 0.05, it means there is no difference significantly in the score fathanah character between control classes and trial classes. Average scores in the trial classes were 23.17 while control classes 23.00.

Tabel 2. Independent Sampel Test of Fathanah

		Levene's test for equality of variances		t-test for equality of means						
				t	df	Sig. (2 tailed)	Mean difference	Std. Error difference	95% confidence interval of the difference	
		F	Sig.						lower	upper
score	Equal variances assumed	1,453	,256	,108	10	,916	,167	1,537	-3,257	3,590
	Equal variances not assumed			,108	6,253	,917	,167	1,537	-3,557	3,890

Discussion

Generally this study provides good results. The experimental classes occurred equity values and increase the study achievements in courses of organic compound structure elucidation. In control classes, only 50% of the participating students who can gain score over 70. While for the experimental classes 100% of the participants obtained the ≥ 70 . This shows that cooperative learning methods in courses of organic compound structure elucidation have a significant influence

Cooperative learning is not only student achievement oriented, but also develop students' social skills. Cooperative learning developed to reach at least three important learning goals, namely: 1) learning academies, this model excels in helping to understand the difficult concepts, 2) acceptance of individual differences, cooperative learning, provides an opportunity for students from various backgrounds and conditions for working together, learn to respect for each other, 3) development of social skills.

The student achievement with cooperative learning is higher than conventional learning. In cooperative learning, students are more active in the group and individual's scores depend on group achievement. So, each student has a responsibility of the individual. Students who are good should be willing to help students who are less intelligent, in order to achieve a high score group.

From the measurement fathanah character score, in general, the impact of cooperative learning are not significant. Cooperative learning which was given only 7 times is not enough to change the behavior and experience of the students. Individual factors are an important role. When students study in groups, they need personal adaptation to make group working effective. According to Slavin (2000), the effects of cooperative learning not always give a good result. But also, from many study shows that a condition in the cooperative learning is fulfilled, positive influence from the study cooperative achievement.

Conclusion

Based on the analysis and discussion, it can be concluded that cooperative learning have a significant effect on student achievement, but do not have a significant effect on fathanah character.

References

- Adz-Dzakiy, M.H.B., Budiharto, S., Zulaifah, E., Kurniawan, I.N., & Riyono, B. 2004. Prophetic Intelligence: Construct Development and Empirical Test for Its Role in the Perception of Unethical Conduct among Indonesian Government Employees. *Paper Presented at International Conference on Muslims and Islam in the 21st Century : Image and Reality*. Petaling Jaya : The Department of Psychology International Islamic University Malaysia and The International Institute of Muslim Unity Kuala Lumpur.
- Budiharto, Sus and Fathul Himam, 2006. *Prophetic Leadership : Developing the Construct and the Measurement*. Jurnal Psikologi, 33(2), 133-145.
- Dikici, Ahyan and Yavuzer Y. 2006. *The Effects of Cooperative Learning on the Abilities of Pre Service Art Teacher Candidates to Lesson Planning In Turkey*. Australian Journal of Teacher Education Vol 31(2).

- Dornyei, Z. 1997. *Psychological processes in cooperative language learning: group dynamics and motivation*. Modern Language Journal, 81, 482–493.
- Doymuş, K ., Şimşek, U., & Karaçöp, A. 2009. *The effects of computer animations and cooperative learning methods in micro, macro and symbolic level learning of states of matter*. Eurasian Journal of Educational Research, 36, 109-128.
- Hanze, M., & Berger, R. 2007. *Cooperative learning, motivational effects, and student characteristics: An experimental study comparing cooperative learning and direct instruction in 12th grade physics classes*. Learning and Instruction, 17, 29-41.
- Milis, Barbara J. 2009. *Becoming an Efectif Teacher Using Cooperatif Learning*. University of Texas- San Antonio : Association of American College and Universities.
- Peklaj, Cirila and Vodopivee Blaz. 1999. *Effects of Cooperative versus Individualistic Learning on Cognitive, Affective, Metacognitive and Social Processes in Students*. European Journal of Psychology of Education, 14(3), 359
- Slavin, R. E. 2000. *Cooperative learning: Theory, research, and practice*. Boston, MA: Allyn and Bacon.
- Yasemin, Kemal Doymus, Ataman Karacop, Ümit Simsek. 2010. *The Effects of Two Cooperative Learning Strategies on the Teaching and Learning of the Topics of Chemical Kinetic*. Journal of Turkish Science Education, 7(2), 52-65.