



THE EFFECTIVENESS OF COOPERATIVE LEARNING MODEL WITH TIME TOKEN ARENDS TYPE WITH RESPECT TO INCREASING OF STUDENTS' PHYSICS CONCEPT UNDERSTANDING AND COMMUNICATION SKILL

Iqbal Renanda Halsyar¹, Widodo²

¹ Department of Physics Education Ahmad Dahlan University

² Department of Physics Education Ahmad Dahlan University

ABSTRACT

Based on observation in SMA Negeri 1 Babakan, Cirebon Regency, West Java Province in Academic Year 2014/2015 in physics subject, found many students who have not reached the Minimum Completeness Criteria (MCC). This shows that students' physics concept understanding is low. In addition, also found that students' communication skill is low. The aim of this study is to determine the increasing of students' physics concept understanding and communication skills in SMA Negeri 1 Babakan, Cirebon Regency, West Java Province through Cooperative Learning Model with Time Token Arens Type. The type of this research is quasi experimental using control group pretest–postest design. Samples were taken by cluster sampling random technique, Class X₁ as the experimental class and Class X₂ as the control class. The experimental class given a treatment by Cooperative Learning Model with Time Token Arens Type. While, the control class given a treatment by Direct Instruction Model. Data analysis technique used is the N-Gain Test.

Based on the data analysis by N-Gain test, the gain of students' physics concept understanding for experimental class is 0.59 and gain for control class is 0.22. While, the gain of students' communication skills for experimental class is 0.50 and the gain for control class is 0.22. Thus, it can be concluded that there is an increasing of students' physics concept understanding and communication skills in SMA Negeri 1 Babakan, Cirebon Regency, West Java Province

Keywords: Time Token Arens, N-Gain, direct instruction, physics concept understanding, communication skill.

INTRODUCTION

Education is a conscious effort to create an atmosphere of learning and the learning process that encourages students actively develop their own potentials in order to have the spiritual power of religion, self-control, personality, noble character intelligence, and skills needed by himself and society. Therefore, education is an aspect of life that is lived by all humans ever since its birth, during its growth and development until he reaches maturity (Susilo, 2007).

Physics teaches a variety of knowledge that can develop the power of reasoning, analysis, to overcome the problems associated with nature can be understood and overcome. By studying the physics we can apply it to everyday life. Basically the fundamental physics is the science (Kusumaningtyas, 2008). Physics is one of the most basic knowledge of science and experimental science. Scientists of all disciplines utilizing the concepts of physics. Physics is also the foundation of engineering science and technology (Young, 2002). Physics (Stanford, 1985) is natural science, one of humankind's responses to its curiosity of how nature works, of how the univers is ordered.

Teachers have an important role in physics student learning outcomes. Low mastery of concepts and not good learning attitude of students suspected to be caused by conventional learning is still dominated by the lecture method, regardless of the activity of student-centered learning (student centered). Conventional learning that takes place tends to run in one direction from the teacher to the student (teacher centered). This physics learning is not effective in developing the cognitive domains (mastery of concepts) and affective (attitude learning) students, so cause the mastery of concepts and attitudes of student learning is low (Samsudin, 2008). Whereas, according to Cardamone (2007), for student using a text, understanding of the central concept is more important than the ability to implement the concept to a specific condition.

The results of observations conducted at SMAN 1 Babakan in physics learning process on March 19, 2015, it was found that the communication skills of students is still low. It is characterized by still passive students in learning, which most students tend to be quiet when the teacher asked. When there is a question of teachers, only

a few students were active and tried to answer the questions of teachers, most students did not respond or reply in response to another friend. Whereas, according to Horan (2008), good communication skills are real key to success.

In observation also found some problems in the process of learning physics, including students' lack of interest and enthusiasm. Minimal completeness criteria (MCC) for the subjects of physics at SMAN 1 Babakan is 75. Of the two classes of the number of 78 students, 65 students have not reached MCC. It shows the results of study of physics is still very low.

To overcome these problems need to use other learning model. One of them is Time Token Arends learning Model. According Fatmawati and Haryono (in Arends, 2008) Time Token is one participate skill in cooperative learning aimed at equal group work opportunity, to avoid student dominate or otherwise silence at all, and encourage students to help each other in small groups.

Cooperative learning (Smith-Stone, 2010) needs courage and persistent, especially during early periode when students have to develop new classroom behaviors. This model could be to train social skills and the ability to communicate, and avoid dominating the conversation student or students who live at all. This model allows students more active in learning and will make learning physics fun. This research was conducted on the subject of dynamic electricity. The reason for choosing the subject of dynamic electricity as learning material in this model is based on several considerations. First, the dynamic electrical material, including material that is abstract, the study of the flow of electric charge that can not be seen. To study this subject students in the skills necessary to design and conduct experiments that are expected to enhance the students' understanding of physics concepts. Second, dynamic electric material relatively difficult, thus requiring cooperation skills and the development of social attitudes of students to be able to communicate well among fellow groups and other groups. In learning materials dynamic power is expected that students actively participate in learning activities for students to improve communication skills and understanding of the concepts of physics, this can be achieved one satunya through learning kooperatif.

Based on above description, it is important to do research on "Effectiveness Model of Learning Time Token Arends and Direct Instruction Against to Upgrades Communication and Understanding Concepts of Physics Class X SMA Negeri 1 Babakan Cirebon, West Java".

The aim of this study is to determine the increasing of students' physics concept understanding and communication skills in SMA Negeri 1 Babakan, Cirebon Regency, West Java Province through Cooperative Learning Model with Time Token Arends Type.

METHODS

The research was conducted on September 5 to May 27, 2015 as many as 2 meetings.

The population in this study were all students of class X SMA Negeri 1 Babakan, Cirebon regency 2014/2015 academic year consisting of 4 and there were 158 students.

The sample were class X₁ and X₂ SMAN 1 Babakan, Cirebon District Academic Year 2014/2015. The sampling technique in this research is cluster random sampling technique. Class X₁, 40 students as the experimental class and class X₂, 40 students as the control class. Based on information obtained from physics teachers class X, both classes have equal ability. When the implementation of this learning model there were some students who do not follow in full, the students were not included in the sample. This was done to avoid differences caused not follow the lesson in full. This research was Quasi Experimental. This research design using experimental study with pretest-posttest control group design for find the score difference between the experimental group and the control group.

Tabel 1. Research Design

Class	Pretest	Treatment	Posttest
C _{Experiment}	Q	X ₁	Y ₁
C _{Control}	Q	X ₂	Y ₂

Description:

X₁ = Physics Learning using the Cooperative Learning Model With Time Token Arends Type.

X₂ = Physics Learning using Direct Instruction Model

Y₁ = Posttest Score of the Experiment Class

Y₂ = Posttest Score of the Control Class

Q = Pretest Score of the Experiment Class and The Control Class

Data analyze used N-Test Gain of Meltzer (in Laili (2013: 66). Test Gain calculate normalized gain value <g>.

$$\langle g \rangle = \frac{\bar{X}_{posttest} - \bar{X}_{pretest}}{100 - \bar{X}_{pretest}}$$

with :

\bar{g} = g factor

$\bar{X}_{pretest}$ = pretest

$\bar{X}_{posttest}$ = posttest

Interpretation of the value of the gain on the criteria presented in Table 2 below.

Tabel 2. Criteria of Gain Value

$\langle g \rangle$ value	Criteria
$\langle g \rangle \geq 0,7$	High
$0,7 < \langle g \rangle \leq 0,3$	Medium
$\langle g \rangle < 0,3$	Low

RESULT AND DISCUSSION

To determine the increasing in communication skills and understanding of physics concepts in cooperative Learning Model with Time Token Arends Type and Direct Instruction Learning Model used normalized N-Gain Test. Here is a summary of the test results of N-Gain, is presented in Table 3

CONCLUSION

The Cooperative Learning Model with Time Token Arends Type More Effective than Direct Instruction Learning Model to Increasing of Students' Communication Skill in SMA Negeri 1 Babakan, Cirebon Regency, West Java Province.

The Cooperative Learning Model with Time Token Arends Type no more effective than Direct Instruction Learning Model to Increasing of Students' physics concept understanding in SMA Negeri 1 Babakan, Cirebon Regency, West Java Province. Based on the table above it can be concluded that The Cooperative Learning Model with Time Token Arends Type More Effective than Direct Instruction Learning Model to increase the Communication Skill. The Gain value show that the increasing of communication skills of the experimental class is 0.40 (medium category), and the increasing of physics concept understanding of the experimental class is 0.59 (medium category) the control class is 0.42 (medium category). Both included in the defferent category, however no significant difference.

REFERENCES

- Arends, R. I. 2008. *Belajar Untuk Mengajar*. Yogyakarta: Pustaka Pelajar.
- Cardamone, Michel J. 2008. *Fundamental Concepts of Physics*. Florida: Brown Walker Press.
- Horan, Sharon Sep, 2008. Occupational Health. 60,9; *ProQest Nursing & Allied Health Source*, 60 (9): 10
- Kusumaningtyas, D. A. (2008). *Materi Ajar Mata Kuliah Sejarah Fisika Tahun Ajaran 2008/2009*.
- Laili Muyassaroh.2013. *Efektivitas pembelajaran berbasis masalah dengan open Ended Problem pada Materi Listrik Dinamis Terhadap Kemampuan Berfikir KritisSiswa*. Thesis. Not Published.

Table 3. The Results of N-gain

Dependent Variable	Class	Pretest	Poetest	Gain	Category
Communication Skill	X ₁	69.00	81.80	0.4	Medium
	X ₂	62.90	70.93	0.22	Low
Physics Concept Understanding	X ₁	51.30	80.80	0.59	Medium
	X ₂	50.63	71.50	0.42	Medium

Stanford, A.L. , Tanner J.M. 1985. *Physics for Students of Science and Engineering*. Florida: Academic Press, Inc.

Susilo, J. (2007). *Kurikulum Tingkat Satuan Pendidikan*. Yogyakarta: Pustaka Pelajar.

Young, D. H. 2002. *Fisika Universitas Edisi Kesepuluh Jilid 1*. Jakarta: Erlangga.

Smith-Stoner, Marily, RN.,Molle. Juni, 2010. Collaborative Action Reseach: Implementation of Cooperative Learning. *Journal of Nursing Education*.4 (96): 312-318