

THE IMPLEMENTATION OF COOPERATIVE TYPE STUDENT FACILITATOR AND EXPLAINING (SFAE) LEARNING MODEL USE THE CONCEPT MAP MEDIA TO INCREASE STUDENTS ACHIEVEMENT IN REDUCTION AND OXIDATION REACTION TOPIC AT X MIA SMAN 2 PEKANBARU

Melda Noparti^{1*}, Yelniati^{2*}, Johni Azmi³, Abdullah⁴

^{1,2}Chemistry Education Study Program on Faculty of Education, University of Riau, Riau, Indonesia

^{3,4}Teacher Training Riau University, University of Riau, Riau, Indonesia

²Postgraduate Program, University of Medan, Medan, Indonesia

*Corresponding author: meldanoparti@gmail; yelniati_yel@yahoo.co.id

Abstract - The research on implementation of cooperative type Student Facilitator and Explaining (SFAE) learning model use the concept map media to increase students achievement has been done on reduction and oxidation reaction in class X MIA SMAN 2 Pekanbaru. This research is experimental research based on pretest-posttest design. The research was conducted on the even semester in academic year 2014/2015. The sample consisted of two classes, namely class X MIA 3 as the experimental and X MIA 1 as the control class which randomly selected after test of normality and homogeneity. The experiment group was applied by the implementation of cooperative type Student Facilitator and Explaining (SFAE) learning model use the concept map media. Data analysis technique used is the t-test. Based on the results of the final data processing obtained $t_{\text{arithmetic}} > t_{\text{table}}$, it is $3,33 > 1,67$ means the implementation of cooperative type Student Facilitator and Explaining (SFAE) learning model use the concept map media can increase students achievement in reduction and oxidation reaction at class X MIA SMAN 2 Pekanbaru. Increased students achievement on experiment class supported the normalized gain scores (N-gain) 0.77 including high category.

Keywords: Cooperative learning model, student facilitator and explaining (SFAE), concept map media, reduction and oxidation reaction

1. INTRODUCTION

Education is a method to develop the potential of human resources through learning activities held at all levels of education form the primary level, secondary and college. Education in the school aimed so that students can have the knowledge, skill, and attitudes learned as a form of learned behavior changes, so that the educational goals can be achieved. [1] Declare to increase student learning, teachers must be able to select and implementation appropriate learning method to increase student achievement. If the teacher managed to create an atmosphere that makes students are motivated to learn, it allows an increase in student achievement.

Based on information from teacher's of chemistry in class X SMAN 2 Pekanbaru, the academic year 2013/2014 the average test scores of students on the subject of reduction and oxidation reaction is relatively low at 67.5. There are still students who have not reached the minimum completeness criteria (KKM) set the school is 76. The low value of the average exam students because learning method used by teachers in school on the subject of reduction and oxidation reaction using a method that is less precise. Chemistry teacher in class X SMAN 2 Pekanbaru has tried using method discussions and worksheets learners (LKS), but the discussions are still some students who are less active. Discussions within the group is dominated by a few people, mainly student of high academic ability, so that other student are less motivated to follow the learning process and make the student do not engage in learning that ultimately lower student achievement.

Efforts made to overcome the problem is to use method learning that can motivate student in learning so that student want to be involved and participate in active learning. One method of learning that is expected to enable the student and make student want to be involved in learning is cooperative type Explaining Student Facilitator (SFAE) learning model use the concept map media. Learning method Student Facilitator and Explaining (SFAE) is a learning method that can obtain the participation of the class as a whole and individually. The advantages of learning method Student

Facilitator and Explaining (SFAE) is to make the student as a facilitator and encouraged to think creatively so as to produce more in-depth information exchange and more attractive and raises self-confidence in student.

Based on the above analysis encourage writer for research about "The implementation of cooperative type Student Facilitator and Explaining (SFAE) learning model use the concept map media to increase students achievement in reduction and oxidation reaction at class X MIA SMAN 2 Pekanbaru".

2. METHODS

This research is an experimental research design with pretest-posttest that has been implemented in class X MIA SMAN 2 Pekanbaru even semester the academic years 2014/2015. The population in this study were students X MIA SMAN 2 Pekanbaru. The sample consisted of 2 classes the next radomly selected class X MIA 3 as an experimental class and X MIA 1 as an control class. Design of research was an experimental study with pretest-posttest, can be seen in Table 1.

Table 1. Research Design

Class	Pretest	Treat	Posttest
Experiment	T ₀	X	T ₁
Control	T ₀	-	T ₁

Information :

X : Treatment of experimental class with the implementation of cooperative type Student Facilitator and Explaining (SFAE) learning model use the concept map media.

T₀ : Pretest value at experimental class and control class.

T₁ : Posttest value at experimental class and control class.

The first step in this research is the holding of normality test to see whether the data were normally distributed or not. Preliminary data on this study tested the normality with Lilliefors normality test equation, with the testing criteria: if $L_{maks} \leq L_{tabel}$ ($\alpha = 0.05$). After the normal distribution of data homogeneity test continued using the formula F test and t-test two hypotheses testing are taken for parties. Data the form of student achievement test scores in the control class and experimental class.

The hypothesis was tested using data from an average difference of pretest and posttest. The formula used for the t-test are as follows:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S_g \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

The deviation standard (S_g) can be calculated using the following formula :

$$S_g^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \quad [2]$$

Category increase student achievement represented by the formula N-gain as follows:

$$N\text{-gain} = \frac{\text{Skor posttest} - \text{skor pretest}}{\text{Skor maksimum} - \text{skor pretest}} \quad [3]$$

Average value category N-gain can be seen in Table 2.

Table 2. Values of N-gain Normalized and Category

Average N-Gain Normalized	Category
$0,7 \leq N\text{-gain}$	High
$0,30 \leq N\text{-gain} < 0,70$	Medium
$N\text{-gain} < 0,30$	Low

3. RESULT AND DISCUSSION

Hypothesis testing is done by using the t test the right criteria increase if $t_{arithmetic} > t_{table}$ with $dk = n_1 + n_2 - 2$. Criteria probability $1 - \alpha$. Based on the analysis of hypothesis testing with $dk = n_1 + n_2 - 2$ and $\alpha = 0.05$ find $t_{arithmetic} = 3.93$ and $t_{table} = 1.67$. This shows that $t_{arithmetic} > t_{table}$ is $3,33 > 1,67$ which means the implementation of cooperative type student facilitator and explaining (SFAE) learning model use the concept map media can increase students achievement in reduction and oxidation reaction topic at X MIA SMAN 2 Pekanbaru. The average difference posttest cause differences in the average gain is normalized (N-gain) for both classes. Data gain normalized (N-gain) for each class, the experimental class of 0.77 is high, while the control class category of 0.69 is the middle category. From the analysis

of the average gain is normalized learning achievement showed that the gain is normalized experimental class is higher than the normalized gain control class. Thus the implementation of cooperative type student facilitator and explaining (SFAE) learning model use the concept map media can increase students achievement on reduction and oxidation topic.

Data for the analysis results of hypothesis testing can be seen from Table 3.

Table 3. Test Result Hypothesis

Class	n	$\sum X$	\bar{x}	S_g	t_{table}	$t_{arithmetic}$	N-gain
Experiment	36	2057,5	57,153	7,59	1,67	3,33	0,77
Control	36	1842,7	51,186				0,69

Cooperative type Student Facilitator and Explaining (SFAE) is applied to the experimental group can increase student achievement because student are invited to participate in all processes of learning, such as reading, asking questions, giving opinions, give advice, answer questions, facilitate their friends (facilitator) in the group and explain the material (explaining) with friends outside of the group in front of the class. Activities facilitator and explaining with friends in a group and other groups have an important role in learning because student inform each other in discussing the problem-solving quickly and precisely. Real learning process would not occur without the opportunity for students to discuss, ask questions, practice, and even taught it to other students [4].

The survey results revealed that students in the experimental class by learning using cooperative type Student Facilitator and Explaining (SFAE) learning model better than students in the control class. Seen that, the students in the class applied cooperative learning model Student Facilitator and Explaining more energetic, have a high curiosity, collaborate and take responsibility in the learning process of the control class. [5] Declare, advantages of cooperative type Student Facilitator and Explaining (SFAE) learning model are the student were invited to explain directly to other students, student can give an opinion/feedback on his mind so it can understand the material being studied and encouraging the growth of the student the courage to express opinions openly.

Student activity can be seen from the desire of student to follow the process of learning, listening to the explanation given by his friend, the student actively ask or answer questions, enthusiasm student in worksheets learners (LKS), discussion and knowledge sharing with the group friends and create a chart in creative at every meeting so it is easy to answer or resolve any questions. experimental class students understanding of the learning material visible from the average value of an experimental class students evaluations were better than the average value of the evaluation of control class at each meeting.

Involvement of the students experiment class is also seem from the attitude of votes at each meeting, where the value of students attitudes experimental class is better than the value of the attitude control class. Aspects assessed at each meeting on the assessment of which is religious attitudes, where students pray before and after the learning process. Next is honest, honesty assessment visits of student in work on the problems of evaluation or examination given teacher. Responsible, assessment visits when student do the questions by teachers, student do the work properly and responsibly. Working together, can be seen in student ability and willingness to cooperate with friends to achieve a common goal. Discipline, can be seen when student work and collect duties in accordance with the specified time. Active student in learning activities gives a positive impact on learning is done, so that student can understand the lesson well.

4. CONCLUSIONS

Based on the result of data analysis and discussion it can be concluded that : (1) The implementation of cooperative type Student Facilitator and Explaining (SFAE) learning model use the concept map media can increase students achievement in reduction and oxidation reaction topic at X MIA SMAN 2 Pekanbaru. (2) Category of increase students achievement is high in experiment class with normalized gain was 0,77 while in control class in middle classified by the normalized gain was 0,69.

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