

# THE IMPLEMENTATION OF COOPERATIVE TYPE STUDENT FACILITATOR AND EXPLAINING (SFAE) LEARNING MODEL USE THE CONCEPT MAP MEDIA TO INCREASE STUDENT ACHIEVEMENT IN CHEMICAL BONDING TOPIC AT X MIA SMAN 2 SIAK HULU

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**Abstract** - The research on implementation of cooperative type student facilitator and explaining learning model has been done to improve of student achievement on the subject of chemical bonding in class X MIA SMAN 2 Siak Hulu. Form of the research is experimental research with pretest-posttest design. The sample consist of two classes, namely class X MIA 4 as the experimental and class X MIA 1 as control class which randomly selected after had tested normality and homogeneity. Experiment class was given implementing cooperative type student facilitator and explaining learning model while the control class was not given implementing cooperative type student facilitator and explaining learning model. Data analysis technique used the t-test. Based on the result of the final data processing t-test formula obtained  $t_{count} > t_{table}$  ( $1,96 > 1,68$ ) means the application of cooperative type student facilitator and explaining learning model can improve student achievement on the subject of chemical bonding in class X MIA SMAN 2 Siak Hulu with the effect of student achievement increasing is 6,52%.

**Keywords:** Cooperative learning model, student facilitator and explaining, learning achievement, chemical bonding

## 1. INTRODUCTION

In order to realize an increase in the quality of education in Indonesia, many attempts were made by the government. One effort is the national curriculum change. The curriculum is a tool to achieve educational goals, as well as guidance in the implementation of education. Curriculum renewal is needed because the curriculum as a means to an end and should be tailored to the ever-changing developments and ongoing.

Curriculum 2013 is a curriculum that demands independence, responsibility and character of the students. So that almost all the learning model in curriculum 2013 a student-centered and a leading role in education. In the application of curriculum 2013 prioritizes three aspects, namely: understanding, skill, and character education. In applying the curriculum 2013 students are required to be active during the learning process and student-centered learning and scientific approach [1].

Based on obtained information from chemistry's teacher SMAN 2 Siak Hulu, the value of student learning on chemical bonding topic is still relatively low. This is evident by the many students who do not meet the mastery learning materials that have been studied previously. the average daily test the students on the subject of colloid is 70. Values obtained are still far from the minimum completeness criteria (KKM) was 75. Many factors led to student achievement is low. One of the factors that cause learning achievement is lower than the minimum completeness criteria is due to less precisely applied learning models during the learning process.

Cooperative learning is a form of learning by students studying and working in small groups collaboratively [2]. Cooperative learning model is a series of learning activities performed by the students in the group, in order to achieve the learning objectives that improve student achievement.

There are many variations in the approaches or types of cooperative learning. Each type or approach of emphasis on specific objectives designed to influence students' interaction patterns [3]. One alternative learning model that is expected to enable students among cooperative type Student Facilitator and Explaining learning model and a scientific approach that encourages students to dare

argue in explaining the material learned to other students. Application of this model is expected to create a memorable student interaction patterns and improve students' creativity and memory. Their social interactions with other friends can stimulate the formation of feedback/new opinions and enrich students' intellectual, which is expected to increase student achievement.

Based on the description that has been presented, the authors are interested in doing research on “**The Implementation Of Cooperative Type Student Facilitator And Explaining (SFAE) Learning Model Use The Concept Map Media To Increase Student Achievement In Chemical Bonding Topic At X MIA SMAN 2 Siak Hulu**”.

## 2. METHODS

This research was conducted at SMAN 2 Siak Hulu at X class odd semester the academic year 2014/2015 starting on November 1 until December 2014. The population in this study were students of class X MIA SMAN 2 Siak Hulu consisting of four classes. The sample consist of two classes, namely class X MIA 4 as the experimental and class X MIA 1 as control class which randomly selected after had tested normality and homogeneity.

Design of reserach was an experimental study with pretest-posttest [4] as shown in Table 1.

**Table 2.** Research Plan

Class	Pretest	Treatment	Posttest
Experiment	T <sub>0</sub>	X	T <sub>1</sub>
Control	T <sub>0</sub>	-	T <sub>1</sub>

Information:

X : Treatment of experimental class with the implementation of Cooperative type Student Facilitator and Explaining learning model

T<sub>0</sub> : pretest value at experimental class and control class.

T<sub>1</sub> : posttest value at experimental class and control class.

Data collection techniques in research is a technique test. Data obtained from: (1) The results of the test material preconditions, (2) pretest, performed on both classes before learning the topic of chemical bonding, and (3) posttest, given on the second class after learning chemical bonding. Data analysis technique used in the study was the t-test. Statistical testing by t-test can be performed based on the criteria of normal distributed data. Therefore, before processing the data, first tested for normality using Liliefors test [5]. After the normal distribution of data, and then test to test the homogeneity of the sample variance (homogeneous or not) [6]. Then proceed with the median equality test using t-test two parties to determine the capabilities of both the sample homogeneity. Hypothesis test used a t-test right side. Increasing student achievement with the provision of material preconditions if  $t_{count} > t_{table}$ .  $t_{table}$  value obtained from the distribution list by the criteria t probability  $1-\alpha$  ( $\alpha = 0.05$ ) and  $df = n_1 + n_2 - 2$  [6]. The size of the increase in student achievement represented by the formula Kp [6] as follows:

$$Kp = r^2 \times 100 \%$$

Where:  $t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$  so be:  $r^2 = \frac{t^2}{t^2 + n - 2}$

Information:

t = the emblem statistic to hypothesis test

n = number of samples the experimental class and control

r<sup>2</sup> = coefficient of correlation

Kp= coefficient of effect

## 3. RESULTS AND DISCUSSION

The data used to hypothesis test in this study is difference between the value posttest and pretest. Difference in value indicates the size of the increase in student achievement before and after studying the materials of chemical bonds or treated and not. The results of the analysis of hypothesis test can be seen in Table 2 and the results of data analysis increase student achievement can be seen in Table 3.

**Table 2.** The Result of Hypothesis Test

Class	N	$\sum X$	$\bar{x}$	$S_g$	$t_{table}$	$t_{count}$
<b>Experiment</b>	30	1517,5	50,5833	9,8363	1,68	1,96
<b>Control</b>	27	1227,5	45,4629			

**Table 3.** The Result of Data Analysis Increase Student Achievement

Class	N	$r^2$	Kp
<b>Experiment</b>	30	0,0625	6,52%
<b>Control</b>	27		

Increasing student achievement with cooperative type Student Facilitator and Explaining greater learning model than on increasing student achievement without cooperative type Student Facilitator and Explaining greater learning model. If it meets the criteria  $t_{count} > t_{table}$  with the criteria of probability  $1 - \alpha$  the 0.95 and  $df = n_1 + n_2 - 2$ . The result of the calculation,  $t = 1.96$  and  $t$  table value at  $\alpha = 0.05$   $df = 55$  is 1.68.  $t_{count}$  greater than  $t_{table}$  ( $1.96 > 1.68$ ) thus the implementation of cooperative type Student Facilitator and Explaining greater learning model can increase student achievement in the subject of Chemical Bonding MIA in class X SMAN 2 Siak Hulu with the effect of student achievement increasing is 6,52%.

The use of cooperative type Student Facilitator and Explaining greater learning model can increase student achievement because students are actively involved in the learning process. The real learning process would not occur without the opportunity for students to discuss, ask questions, practice, and even taught it to other students [8]. Increased student achievement can be seen from the average value of the evaluation of any meeting of the second class, the experimental class evaluation value is higher than the control class. this is due to the effect of the implementation of cooperative type Student Facilitator and Explaining greater learning model.

Cooperative type Student Facilitator and Explaining greater learning model starts with the students divided into several groups. Each group of students is heterogeneous based on level of student ability. Furthermore, each group will be assigned one of the members of the group responsible as a facilitator for group members in charge and responsible for explaining the learning materials to the members of the group. The next student work Worksheet Students (LKPD). Once the student worksheets learners one member of the group selected at random by the teacher to explain the material using charts and answering media worksheets learners in the classroom. The average value of worksheets learners by implementing cooperative type Student Facilitator and Explaining further increased in comparison with worksheets learners without using cooperative type Student Facilitator and Explaining.

At the end of the meeting, students were given about the evaluation and worked on individually [9]. It aims to measure students' understanding of the material that has been studied. Based on the evaluation of each meeting of the experimental class and control class, the average value of the evaluation of the experimental class is higher than the control class. This is due to the student is given a different treatment in the second class. Where the experimental class in implementing cooperative type Student Facilitator and Explaining, while the control class is not implemented cooperative type Student Facilitator and Explaining.

The learning model Student Facilitator and Explaining, students are invited to participate in all of the learning process, whether it's reading, ask questions, express opinions, give advice, do the problems, facilitating their friends (Facilitator) in a group and communicate or explain the material (Explaining) with friends outside of the group in front of class.

Student activity the experimental class seen from the assessment at each meeting, where the value of the attitude of the experimental class is better than the value of the attitude control class. Where aspects assessed at each meeting is religious, where students pray before and after the learning process. Furthermore honest, where the views of honesty student assessment work on the problems of evaluation and examination given. Responsible, where assessment visits of the student's responsibility as a facilitator and do the questions provided by the teacher. Working together, can be seen when the student worksheets learners. Discipline, punctuality can be seen from the herd of students in a given task.

Based on the survey results revealed that students in the experimental class is more active than the control class. It can be seen from the student's ability to participate in the whole process of learning, students actively asking or answering a question, the spirit of the students in the worksheets of students, discussions and exchange opinions with members of the group and the other group members, making it easier to answer and resolve any questions.

Group award is also given to students who are determined from the average score of individual development based on a different member of the group with a base score evaluation score at each meeting. Each group member has the right to donate points that will determine the level of award for each group. The existence of the award, then each member of the group was responsible for the group's success and will be motivated to do the evaluation as well as possible in order to get the best tribute that the group as a super group.

#### 4. CONCLUSIONS

Based on the results of data analysis and discussion it can be concluded that: (1) The implementation of cooperative type SFAE learning model can increase student achievement in chemical bonding topic at X MIA SMAN 2 Siak Hulu. (2) Effects increase student achievement with the implementation of cooperative type SFAE learning model at X MIA SMAN 2 Siak Hulu was 6,52%.

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