

## **IMPLEMENTATION OF GUIDED-INQUIRY TO PROMOTE STUDENTS' METACOGNITIVE SELF REGULATION IN XI GRADE**

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### **ABSTRACT**

This study aims to describe the ability of metacognitive self-regulation of XI grade students of SMAN 2 Lamongan after implementation guided inquiry learning model on reaction rates material. One group pretest-posttest design was used in research. Students in XI grade of SMAN 2 Lamongan as result subject. Metacognitive Activities Inventory (MCA-I) used as pretest and posttest instruments while achievement, metacognitive test and interviews test were conducted in the end of learning. Non-test instruments were class management and students activities observation sheets. The results showed that the students self-regulation has increased especially in monitoring, followed by evaluating and planning skill. As many as 66.67% students in low level jump to moderate and 13.04% students in moderate jump to high level. This result are supported with students learning outcomes that can reach classically mastery of learning is 86.11%, metacognitive test and interview that show same level as in MCA-I data, students activities during learning shows that the activities support self-regulation in monitoring skill dominantly, implementation of guided inquiry is effective with good and very good criteria, so it can promote metacognitive self-regulation.

**Keywords:** *guided-inquiry, metacognitive self-regulation*

### **INTRODUCTION**

Quality of education in Indonesia so far remained much improved in comparison with the quality of education in other countries. One of the data about quality of education related to the Human Development Index (HDI). HDI data released by the United Nations Development Program/ UNDP on November 2, 2011, it appears that Indonesia is in the bottom rank among the ASEAN countries. Indonesia is categorized as a country with the Medium Human Development and only ranks 124 of 187 countries in the world.

Indonesia's lack of achievement has been the concern of many educators. The government has organized the improvements improve the quality of education. But it seems not give satisfactory results. These results should be recognized for education in Indonesia is only visible from the ability to memorize facts, concepts, theories or laws. Although many children are able to present a good level of memorization of the material it receives but in fact they often do not understand the substance of the material (*Pusat Kurikulum Badan Penelitian Dan Pengembangan Departemen Pendidikan Nasional, 2007*). Students' lack of understanding is also because students do not have the awareness about how to learn (*Pusat Kurikulum Badan Penelitian Dan Pengembangan Departemen Pendidikan Nasional, 2007*). If students are able to understand how to learn or understand how to apply metacognitive skill when studying a variety of subjects including chemistry then received information can transfer into long-term memory and will be more meaningful.

Based on the results of student questionnaire on metacognitive abilities, as much as

14.28% of students who use the planning skills, 17.85% of students who use the monitoring skill, and 25% of students who use evaluating skill. Beside that, results of interviews with 28 students of SMA Negeri 2 Lamongan in Class XI IPA 5 as much as 53.57% of students stated that the reaction rate of the material is a difficult material.

Generally, based on the results of student questionnaire above, shows that the self-regulatory metacognitive skill of students of class XI IPA 5 SMAN 2 Lamongan is still low with a percentage of less than 50%. This is because there are now learning chemistry is still not able to develop metacognitive skill of the students' self-regulation. Based on the above explanation, it seems clear that the related process of learning, metacognitive skill which includes planning, monitoring, and evaluating skills should always be empowered. One of the ways is through the implementation of Guided Inquiry Learning Model.

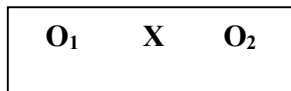
Guided inquiry learning model is chosen because it needs active role of students in learning so that students are expected to use metacognitive abilities as much as possible and also in implementation of guided inquiry, the teachers still provide direction and guidance to the students. And it absolutely makes the students become more focused on the process of investigation conducted.

Based on the background above, the problem can be formulated: 1). How about activities of students in XI grade SMA Negeri2 Lamongan after implementation of guided inquiry learning model in reaction rates material? 2) How about feasibility of guided inquiry learning model in reaction rates material in XI grade SMA Negeri 2 Lamongan? 3). How about learning outcomes of students XI grade SMA Negeri 2 Lamongan after implementation of guided inquiry learning model in reaction rates material?

The purpose of this research: 1). To describe activities of students in XI grade SMA Negeri 2 Lamongan after implementation of guided inquiry learning model in reaction rates material 2) To describe feasibility of guided inquiry learning model in reaction rates material in XI grade SMA Negeri 2 Lamongan 3) To know learning outcomes of students XI grade SMA Negeri 2 Lamongan after implementation of guided inquiry learning model in reaction rates material.

### Research Method

This research is a pre-experimental design with the objects are students of XI Grade of SMAN 2 Lamongan. The design study is one group pretest-posttest. The design of this study can be described as follows: (Sugiyono, 2010: 75)



Explanation:

$O_1$  : Pretest score of metacognitive self-regulation of students

$X$  : Treatment

$O_2$ : Posttest score of metacognitive self-regulation of students

Learning device used in this study were developed by the researchers themselves which will be validated by the chemistry lecturer. The device consists of: a) Syllabus b) Lesson Plan c) Students Worksheet

While the research instrument used in this study include: a) Metacognitive Activities Inventory (MCA-I) b) Metacognitive skill test c) Interview Sheet d) Observation sheet e) Students Learning Outcomes Test.

Data analysis that is used in this research is explained below:

#### a. Analysis of MCA-I

There are two techniques of analysis used in this study, which is the first quantitative data analysis techniques to determine whether there is any effect of implementation of guided inquiry learning model of the metacognitive self-regulation skill of students. Previously calculated values of metacognitive self-regulation skill of students with the following

procedures:

- 1) The score of students' metacognitive self - regulation is obtained by calculating the total score of the students' answers on the Likert scale (always to never). For items positive always answer get the score 5, Often get the score 4, sometimes get score 3, seldom get score 2, and never get score 1. As for the negative items have a value that is the opposite of the positive items.
- 2) Calculate the average score of metacognitive self-regulation skill of students from the pretest and its standard deviation. The measurements using the formula (Sudjana, 2005):

$$\bar{x} = \frac{\sum x_i}{n} \dots\dots\dots(1)$$

with:

- $\bar{x}$  = average score of metacognitive self-regulation
- $x_i$  = total of students metacognitive self-regulation score
- n = number of students

While the standard deviation (SD) was measured by using the formula (Sudjana, 2005):

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \dots\dots\dots(2)$$

with:

- $x_i$  = the data score of student  $i$
- $\bar{x}$  = the average score of the overall metacognitive skill

- 3) Grouping students into three level, namely (Pulmones, 2007):
    - a. Low-level with a range of values (minimum average score until  $\leq ((-SD) + \bar{x})$ ).
    - b. Moderate-level with a range of values  $> ((-SD) + \bar{x})$  until  $\leq (\bar{x} + (SD))$ .
    - c. High-level with a range of values  $> ((\bar{x} + (SD))$  until  $> ((\bar{x} + (SD))$  s/d nilai maximum average score).
  - 4) Calculate the average of the students' metacognitive ability posttest results using the formula (1).
  - 5) Comparing the average value of the initial capability with the average value of the final capability. This is done by conducting a descriptive analysis of their skill in each component of the planning, monitoring, and evaluating. This description is supported by the results of interviews of representatives of each group of students and the level of metacognitive skill test results.
  - 6) Determine the average self-regulatory metacognitive capabilities include: planning, monitoring, and evaluating of all students by using the formula (1).
  - 7) Determine the components of which are crucial to the self-regulatory metacognitive skill of students, whether planning component, monitoring, or evaluating by looking at the average results.
- b. Analysis of Metacognitive Skill Test
- It is analyzed by the way of students to do all of the question in this test. Maximum score given to such questions is 4 and the minimum score given is 1. Then calculated the average score for that question then the results are grouped based on the criteria of the scale range of 1.3 to each group as follows:
- Scores for high levels of self-regulation: 2.8 - 4.0
  - Scores for intermediate level of self-regulation: 1.4 - 2.7
  - Scores for the low level of self-regulation: 0 - 1.3
- c. Analysis of Interview Test
- It is analyzed descriptively.
- d. Analysis of Students activities
- Observations were made every five minutes during the learning takes place that dominant in a group. Students activities percentage is calculated by using formula below:

$$\% \text{ category of students activities} = \frac{\text{amount of each activity}}{\text{Amount of all activities in 90 minutes}} \times 100\%$$

e. Analysis of Guided Inquiry Learning Model Feasibility

It is analyzed descriptively then determined the score of teacher's activities by using scale 1-5. The data is gain is analyzed to get the average of *KMP* (*Kriteria Mengelola Pembelajaran*) by using formula below:

$$KMP = \frac{\text{Total Score}}{\text{Total Number of Items}}$$

Then the score is converted to the criterion shown below:

No.	Score	Criterion
1	0-1,1	Very bad
2	1,1-2,2	Bad
3	2,2-3,3	Enough
4	3,3-4,4	Good
5	4,4-5	Very Good

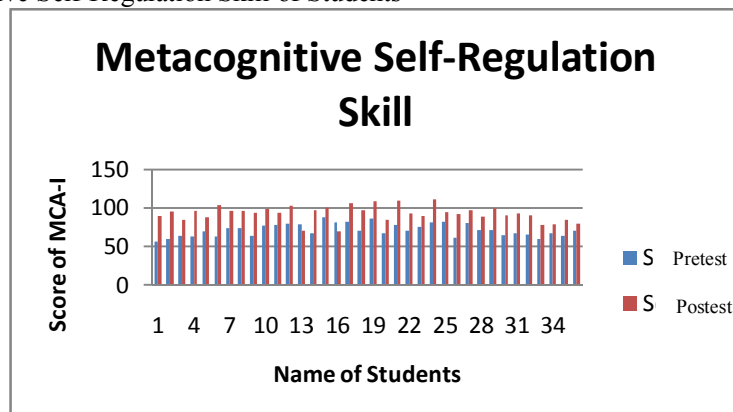
f. Analysis of Students Learning Outcomes.

It is analyzed to know mastery of students. Classically, a class is said to pass the study if there is a minimum of 75% of students who had received grades  $\geq 80$  according to the Complete Standard Minimum value set at SMAN 2 Lamongan for chemistry subjects was calculated as follows:

$$\text{Student learning outcomes} = (\text{Score obtained}) / (\text{maximum score}) \times 100$$

## DISCUSSION

### a) Metacognitive Self-Regulation Skill of Students



Generally, there is an increase from pretest score to posttest score of students' metacognitive self-regulation skill. The students self-regulation has increased especially in monitoring, followed by evaluating and planning skill. As many as 66.67% students in low level jump to moderate and 13.04% students in moderate jump to high level b) Students' activities recorded some decline and rise of the meeting 1, 2, and 3. Most of the activities of the student demonstrate their metacognitive self-regulation skill. c) Feasibility of guided inquiry learning model is effective, based on the average score at meetings either category 1 (3.75), meeting 2 and 3 including the excellent category (4.52 and 4.53) d) Learning Outcomes of Students

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No.	Characteristics	Test Result
1.	Number of Students	36
2.	Number of incompleteness students	31
3.	Number of completeness students	5
4.	Classically mastery learning	86,11%

## CONCLUSION

Metacognitive self-regulatory ability of students has increased, especially in the aspect of monitoring, evaluation and follow aspects of the lowest on the planning aspects. A total of 66.67% of students low group category, go to the middle group and 13.04% of students get into the middle class category groups the high group category. Metacognitive ability test results and interview students showed levels of self-regulatory metacognitive abilities of students in accordance with the results of the MCA-I. Percentage of student activity dominant in activities that support the monitoring aspect. Feasibility study in the form of a teacher's ability to manage the learning gets good and excellent categories that support the improvement of self-regulation metacognitive abilities of students. Students learning outcomes achieved by classical completeness percentage of 86.11% .

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