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Learning Approach Metakognitif Towards Mathematical Reasoning Ability Of Studentsin Class VIII Secondary School Negeri 4 Bilah Hulu

Rohani[1], Amin Harahap[2*], Eva Julyanti[2], Lily Rohanita Hasibuan[2], Indah Fitria Rahma[2], Arman Harahap[2]
[1,2]Fakultas Keguruan dan Ilmu Pendidikan Universitas Labuhanbatu

Abstract:- This study aims to determine the learning approach metakognitif towards mathematical reasoning ability of students on the subject of systems of linear equations two variables (SPLDV). This research was conducted in Secondary SchoolNegeri 4 BilahHulu. This type of research is quasi-experimental (quasi-experimental) and the research design used in this research is One-Group Pretest–Posttest Design. Population in research is all students of class VIII Secondary SchoolNegeri 4 BilahHulu totaling 54 students, the study sample is students of class VIII1 totaling 27 students. The instrument used is a test instrument form description as much as 5 about. Data obtained from the results of a test given to students in the form of a pretest is given before the learning process and a posttest given at the end of the learning process. The value of students before being given treatment with the highest value of 53, the lowest value of 25 with a mean of 34.40 and the standard deviation 8,59454. meanwhile, after being given treatment using a learning approach metakognitif there is an increase of the highest value 69, the lowest value of 54 with the average of 62.44 and standard deviation 4,43182. in general students in grade VIII1 after treatment increased. Analysis of test data using Paired Samples T-Test, based on the analysis of the data obtained the value of tcount>ttable namely 17,504 > 2,052 means there is a significant difference of the measurement data of the pretest and posttest. Then ha is accepted. It can be concluded that there is influence of learning approach metakognitif towards mathematical reasoning ability of the students on the material Systems of Linear Equations Two Variables (SPLDV).

Keywords:- *Learning Approach Metakognitif Towards Mathematical Reasoning Ability of Student*.

I. INTRODUCTION

In achieving the goal of a good education, required a process of thinking and reasoning of students in mathematics learning. With regard to reasoning, the National Council of Teacher of Mathematics (Safari et al., 2016) said that in the implementation of learning mathematics, emphasizing the general purpose of learning mathematics, namely: communication of mathematical (mathematical communication), mathematical reasoning (mathematical reasoning), mathematical problem solving (mathematical problem solving), the connection mathematically (mathematical connections), and the formation of positive attitudes towards mathematics (positive attitudes toward mathematics). It shows that reasoning ability is one of the ability mathematically which have to be developed in mathematics learning in the classroom. Therefore, the teacher has a role in fostering mathematical reasoning ability in students either in the form of learning methods used, and evaluation in the form of making about that support.

Reasoning is an activity or process of thinking to draw conclusions or make a new statement based on the previous statement and the truth has been proven. Turmudi (2008) say that the ability of reasoning mathematically is a habit of the brain as well as other habits that should be developed consistently using a wide variety of contexts, recognize reasoning and proof are fundamental aspects in mathematics. With mathematical reasoning, the student can file an allegation then compile the evidence and perform the manipulation of mathematical problems and draw conclusions correctly and precisely. (Mosharafa, 2015)

Based on the results of observation conducted by the researcher in grade VIII Secondary SchoolNegeri 4 Bilah Hulu that students in class VIII many have difficulty at the time of completing a different set of questions with the teacher's explanations. This proves that students ' difficulty in connecting the new concept with a concept that has been there before. It is also corroborated by the results of initial research by the author to provide some test questions to measure the level of mathematical reasoning ability of students in class VIII Secondary School Negeri 4 Bilah Hulu, that only gets the average value above KKM which is 65 only 23% of students and 77% did not complete the question properly. It can therefore be concluded that the mathematical reasoning ability of students in class VIII Secondary SchoolNegeri 4 Bilah Hulu is still very low.

Improving mathematical reasoning skills students need to be supported by the approach of appropriate learning so that learning objectives can be achieved rests on the ability of teachers to anticipate needs and materials or models that can help the students to achieve the learning objectives. Supported by Sagala (2011) that teachers need to have learning methods as a strategy that can facilitate the learners to master the science knowledge given.

To overcome the problems mentioned above, it is required an appropriate strategy,which will have an impact on the improvement of mathematical reasoning ability. One of learning who is considered the author can improve the

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mathematical reasoning ability of students is with the learning approach metakognitif.From the results of the research Harahap, a (2016) using the approach method of investigation of the group increased, so the researchers tried to approach metakognitif to see is there any improvement in the learning process. O'neil (NE Mawaddah, 2015) stating that the approach metakognitif consists of four aspects, namely: (1) awareness (awareness), (2) cognitive strategy (strategy cognitive), (3) planning (planning), and (4) review (review). Awareness (consciousness) includes awareness of own thinking, knowing about the technique or strategy of mind which to use and when to use it, know your needs will plan its own actions, understand the process of thinking and knowing the experiments conducted to understand the question test first before completing. While the cognitive strategy (strategy cognitive) includes trying to determine the main ideas in the test, , think about the intent of the question test before starting to finish, asking yourself about the interconnectedness of the questions test the knowledge using some techniques or strategy of thinking in accordance with the questions of the test, selecting and grouping the relevant information to complete the question test. Planing (planning) includes trying to understand the purpose of the question test, determine what is required, knowing what to do and how to do it, determine how to resolve the question of the test, understand the questions test. While the review (review) includes a check result of the work, correcting errors, knowing how many questions can be resolved, continue to track the progress if necessary change techniques and strategies, and check the ability through the test. While the experience metakognitif is a process-a process that can be applied to control activity-cognitive activity and achieve the goal-the goal of cognitive. This ability is made melaluiaksi-action among the four classes of phenomena, among others, knowledge of metacognition, experience metacognition, goal or task, and the action or strategy (Kuntjojo, 2009).

Based on the description above, the researcher is compelled to conduct research that may affect the ability of mathematical reasoning with the title "Approach Metakognitif towards mathematical reasoning ability of students in class VIII Secondary SchoolNegeri 4 Bilah Hulu.

II. METHODS

This research will diilakukan in Secondary SchoolNegeri 4 BilahHulu of the Village of Port High District BilahHulu Kabupaten Labuhanbatu. The sample used in this study class VIIIa, which amounted to 27 students.

Variables that are contained in it as much as two fruit namely:

- The independent variable (X), i.e., the learning approach metakognitif.
- The dependent variable (Y) which mathematical reasoning ability.

Researchers use data collection techniques that test. The test for quantitative data (type written, form the description of)the test.The test in this case is the collection of data in the form of the question/problem to obtain data regarding the ability of students mainly on the cognitive aspects. In this study, the test serves to test the ability of mathematical reasoning of the students in the class. This test is administered before treatment (pre-test) and after treatment (post-test) in the experimental class.

➢ *Data Analysis Techniques*

This research use quantitative analysis which is an analysis technique that penganalisaannya with the calculation, because it deals with numbers, i.e. from the results of the test given.

No	The formulation of the	Hypothesis	Test
1.	Whether there is influence of learning approach metakognitif towards mathematical reasoning ability of students grade VIII in Secondary SchoolN4 BilahHulu	There is the influence of mathematical reasoning ability of students in the teaching learning approach metakognitif.	Uji T

Tabel 1:- The Linkages Between The Formulation of the, Hypothesis, Test Statistics

➢ *Testing Normality*

After the performed test validitas dan reliabilitas then rendered the test of normality. Testing normality is assays regarding kenormalan data distribution. Test of normality used untuk menguji apakah data distribution normal ou tid. Untuk mengukur normality, used the formula following :

$$X^2 \sum \frac{(f_{oi} - f_{hi})^2}{f_{hi}}$$

Disclosures:
f_{oi}= the frequency of the observation to-i
f_{hi}= the frequency of hope to-i

3.9.2. Homogeneity Test

Homogeneity test was conducted to determine whether a sample comes from a population that has a variance that is the same or not the same. Test of homogeneity imposed on the data results of post-test of the groups of experiment and control. To measure the homogeneity of the variances of the two groups of data, use the formula F test as follows :

$$F = \frac{Variansterbesar}{Variansterkecil}$$

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To take a decision by comparing the value of Fcount with the value of Ftable. The criteria is :
If Fcount≤>Ftable then the normal distribution of data
If Fcount>Ftable, the data is not verdistribusi normal

➢ *Technique validity of the research instrument*

- *Test vadilitas research instruments*

Test vadilitas used to get the level of kevaliditan an instrument in order to get the accuracy between the data that actually occur in data objects that can be collected for research. The requirements that must beobtained item is valid if rxy >rtabel that 0,374. Penguju the validity of the instruments used product moment correlation technique of Karl pearson by the following formula:

$$R_{xy} = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{\{N\sum X^2 - (\sum X)^2\}\{N\sum Y^2 - (\sum Y)^2\}}}$$

Description:
∑X = Sum of product score X
∑Y = sum of product score Y
N = number of students
rxy = correlation coefficient of score points and total score

To interpret a price the validity of each item compared with the price of criticism of the validity of the product moment (standard signitifikasikan α = 0.05) with the criteria rhitung > rtabel then the item is declared invalid or vice versa. Price rtabel obtained from the list of r product moment with α = 0.05. 0,800 < rxy ≤ 1.00 to = the validity of the very high N0,600 < rxy ≤ 8,00 = high validity (either) 0,400 < rxy ≤ 6,00 = validity enough 0,200 < rxy ≤ 4,00 = less 0,000 < rxy ≤ 2,00 = validity is very less (not valid)

- *The reliability test of the instrument*

Reliability indicates that the instrument can quite believe that is used as a means of collecting data because the instrument is already good. Test reliability of the questionnaire of self-confidence, opserpasi the liveliness of students and mathematics achievement tests natematika can be calculated by using the formula K-R20 that was statedby Kuder:

$$r_{11} = \left(\frac{n}{n-1}\right)\left(\frac{s^2 \sum pq}{s^2}\right)$$

Where:
r11 = Coefficient of reliabelitas test
p = the proportion of subjects who answered the item correctly
q = the proportion of subjects who answered the item incorrectly
∑pq = sum of the result of the multiplication between p and q
n = a Lot of items or a lot of his questions
S2 = Variance of the total

To interpret the price of reliability, then the price of the dikompirmasikan with the price of criticism r table of product moment with α = 0.05. If rhitung ≥ rtabel then the questionnaire is declared reliable, which means it can dioercaya.

As for the criteria of reliability as follows:

0,00 – 0,20 = very low
0,21 – 0,40 = low
0,41 – 0,70 = are
0,71 – 0,90 = high
0,91 – 100 = very high

- *Test Difficulty Level*

Numbers that show the hard and easy it is of a problem called the tribulation (difficulty index). To test the applicability cropper used the following formula:
P= B/JS

Where:
P = Index cropper about the
B = Number of students who answer the questions correctlyJS = The whole number of test participants.
The criteria of difficulty level of the questions are:
P = 0,00 – 0,30 = s0al difficult
P = 0,31 – 0,70 = about medium
P = 0,71 – 100 = a matter of easy

- *Distinguishing Features*

discrimination is the ability of a question to distinguish between students who are good at (enabled high) with students who are stupid (berkamampuan low).
D = BA/JA - BB/JB = PA – PB

Where:
D = discrimination (discrimination)
BA = Byaknya the participants of the top group who answer correctly
BB = the Number of participants easyli that are answered correctly
JA = Number of participant groups above
JB = Number of the participants of the group under

Classification of distinguishing features is a:
Discrimination = < 0,00 = very ugly
Discrimination = < 0,00 – 0,19 = ugly
Discrimination = < 0.20 to 0.39 = enough
Discrimination = < 0,40 – 0,69 = Good
Discrimination = < 0,70 – 100 = Good

➢ *Hypothesis Test*

To determine the effect of model learning approach metakognitif towards mathematical reasoning ability of the students, then test the paired samples T - Test where the test paired samples T - Test is a test that shows how big the influence of one independent variable individually in applying the variable.

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III. RESULTS AND DISCUSSION

Before doing the research with the approach of learning to be studied. The researchers first gathered data by conducting a preliminary test (pre-test) in the form of giving a written test form description as much as 5 a matter with the material SPLDV. This test is done toknowing the scores of the students before being given treatment (treat meant). After done the initial tests, further treatment, i.e. apply a learning approach metakognitif towards mathematical reasoning ability of siwa in the class VIII Secondary SchoolN 4 BilahHulu.

No.	Statistika	*Pre-test*
		Eksperimen
1	*Mean*	34,40
2	*Standart Deviasi*	8,59454
3	*Varians*	73,8661
4	Skor Tertinggi	53
5	Skor Terendah	25

Table 2:- Results of Pre-test Mathematical Reasoning Ability of Students

Based on the above table the results of the pre-test mathematical reasoning ability of students which is the highest value of 53 and a low of 25

Tags	Criteria
High	Students who have a value with the interval 61-90
Are	Students who have a value with the interval 31-60
Low	Students who have a value with an interval of 10-30

Table 3:- The Grouping Of Scores The Assessment Of Mathematical Reasoning

No.	Interval	Frekuensi
1	71 – 80	-
2	61 – 70	-
3	51 – 60	2
4	41 – 50	4
5	31 – 40	9
6	21 – 30	12
7	10 – 20	-
The number of		27 People

Table 4:- The results of clustering the pre-test

Based on the above table it is seen that the mathematical reasoning ability of students grade VIII Secondary School Negeri 4 BilahHulu of the 12 students in the low category and 15 students in the medium category.Once students are given the test early then will be given a behaviour learning approach metacognition will then be back given the test form Post-test to see the influence of the application of the commission of the

No.	Statistika	*Post-test*
		Eksperimen
1	*Mean*	62.44
2	*Standart Deviasi*	4,43182
3	*Varians*	19,641
4	The Highest Score	69
5	The Lowest Score	54

Table 5:- Results of Post-test of Reasoning Mathematical Students

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Based on the above table the results of post-test activity students ' mathematics learning of the highest value of 69 and a low of 54, then it can be grouped as in the table below :

No.	Interval	Frekuensi
1	71 – 80	-
2	61 – 70	15
3	51 – 60	12
4	41 – 50	-
5	31 – 40	-
6	21 – 30	
7	10 – 20	-
The number of		27 people

Tabel 6:- Hasil pengelompokkan *post-test*

Based on the above table it is seen that the mathematical reasoning ability of students grade VIII Secondary School Negeri 4 BilahHulu of the 15 students in the high category and 12 students in the medium category.

It can be seen that after a given treatment is the approach to lessons metakognitif affect the mathematical reasoning ability of students seen from the comparison of the initial test(pre-test) and final test (post-test). Below is depicted the histogram of the results of the test has been done.

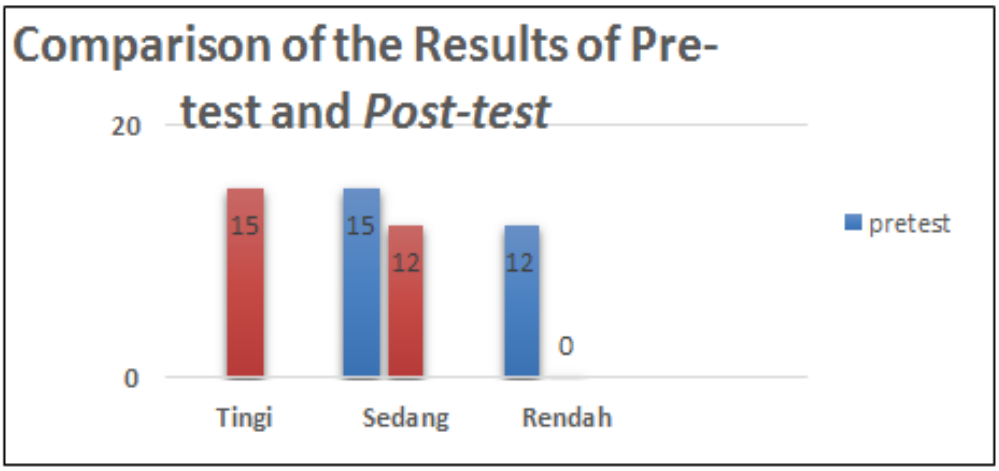

Fig 1:- Perkandingan the Results of pre-test and after the test

From the chart above, before treatment is given, students who have high category does not exist, but after given the treatment of students who have high category to 15 people. For the medium category, before treatment there were 15 people and after the given treatment and there are 12 people. Then before given the treatment, students who have a low category as much as 12 people, but after the treatment is given students who have a category low no. It is clear that the treatment (treatment) that affects the results the students obtained.

➢ *Discussion of Research*

From the test results given can be seen from the lowest score the results of the pretest was 25, after a given treatment the lowest score posttest to 54. While the highest score of the pretest of the students was 53, after being treated, the highest score of posttest was 69, Then concluded that after treatment there is an increase in other words the score of posttest is higher than the pretest score.

In addition to seen from the test results the influence of mathematical reasoning ability of students can also be seen from the results of the process of data analysis and hypothesis testing has been done in this study, determined the matters related to discussion of research, namely : From the test results of the Paired Sample T-Test in the classroom experiment by means of SPSS obtained the value of sig .< than the significance level that is 0,000 < 0,05 with db = n-1, namely db = 27 – 1 = 26, and the values obtained t_(count)> t_(table), namely 17,504 > 2,052, then the conclusion Ho is rejected and Ha accepted, which means there is significant influence between the learning approach metakognitif towards mathematical reasoning ability of students in class VIII Secondary SchoolNegeri 4 BilahHulu Years Learning 2018/2019 after a given treatment.

Thus the research “the Influence of Approach to Learning Metakognitif Towards Mathematical Reasoning Ability of Students Grade VIII Secondary School Negeri 4 BilahHulu” able to answer the hypothesis and the formulation of the problem proposed through the analysis of the data obtained.

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IV. CONCLUSION

There is a learning Approach metakognitif towards mathematical reasoning ability of students grade VIII Secondary School Negeri 4 BilahHulu. It can be seen from the data comparison the results of pre-test and post –test. The lowest score pretest was 25, after a given treatment scores posttest low to 54. The highest score of pretest of students was 53, After a given treatment score post test the highest is 69. Similarly, test based on paired samples T-test obtained value so that the value of tcount > ttable namely 17,504 > 2,052 then HO is rejected and Ha accepted.

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