EFFECTIVENESS MODEL OF *AUDITORY INTELLECTUALLY REPETITION* (AIR) TO LEARNING OUTCOMES OF MATH STUDENTS

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ABSTRACT

This study aims to determine: (1) a description of the results of students' mathematics learning taught by AIR models; (2) a description of the results of studying mathematics taught by direct learning model; (3) the effectiveness of mathematics learning outcomes of students taught by AIR models and direct learning model. This study is a quasi-experimental research. The population in this study were all students of class VIII SMPN 12 Kendari which consists of 6 classes and selected a sample of two classes. Determination of the sample in this research is purposive sampling. Collecting data in this study conducted by administering instrument in the observations form and the learning results test by the descriptions test to the students. Based on data analysis and discussion concluded that the results of students' mathematics learning taught by AIR learning model is better than the results of students taught mathematics direct learning model.

Keywords: effectiveness , Model *auditory intellectually repetition (AIR)*, mathematics learning outcomes of student

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A. INTRODUCTION

Mathematics is a branch of science that is important, but in reality the students still have difficulty in learning mathematics. Gelman in Handayani (2004) says that math is a lesson that potentially may experience one and failed. According to the views of students, mathematics is an abstract science. Students who have high math ability will assume that the math is easy, whereas for students who have a low regard math skills math as a difficult subject and frightening.

Student difficulties in learning mathematics is caused by two factors: factors of intellectual and pedagogical factors (Brueckner and Bond in Widdiharto, 2008). Intellectual factors related to the student's difficulties in mastering the concepts, principles, or algorithms. In addition, students also have difficulty abstracting, generalizing, deductive reasoning, and remembering concepts and principles of mathematics. Pedagogical factors: factors Flawed teachers manage learning and applying the methodology. In general, how teachers choose methods, approaches and strategies in learning has an effect on the ease or difficulty of students in learning. Therefore, teachers should be able to implement innovative models of learning so that students will feel motivated to learn mathematics.

Based on interviews with Mathematics teacher at First Secondary School Country 12 Kendari (SMPN 12 Kendari), obtained information that the learning outcomes of students Math Class VIII SMPN 12 Kendari academic year 2015/2016 with the material coordinate system scored an average 64.21. This value is still relatively low compared to the standard value set by the school. This is because (1) most of the students are less interested in studying mathematics because prior knowledge of mathematics is still low, (2) the majority of students tend to memorize a concept not understand that, when faced with a math problem, students are still difficulties in using concepts into solving problems, (3) when given a problem, students feel confused in the finish because students just stare at the sample questions has been given.

One innovative learning models and can solve the above problems is a cooperative learning model type Auditory Intellectually Repetition (AIR). This learning model assumes that a learning is more effective if attention to three things: Auditory, Intellectually, and Repetition.

Auditory means used in the ear senses learns by listening, speaking, presentations, argumentation, express opinions, and responding. Intellectually means thinking skills need to be trained through the exercise of reason, create, solve problems, construct and implement. Repetition and repetition means necessary in learning to the broader and deeper understanding. For example, students need to be trained by working the matter, assignments or quizzes.

Suherman in Yulianti (2012) revealed AIR learning model is a learning model that assumes that a study would be effective if attention to three things: Auditory, Intellectually, and Repetition. Auditory means used in the ear senses learns by listening, speaking, presentations, argumentation, express opinions, and responding. Intellectually means thinking skills need to be trained through the exercise of reason, create, solve problems, construct and implement. Repetition means repetition is necessary in learning to be a deeper understanding and broader, students need to be trained by working the matter, assignments, and quizzes.

Linksman in Alhamidi (2006) defines auditory in the context of learning as learning by listening, talking to himself, and also discuss their ideas and thoughts on others. Meier (2002) that "intellectually showing what learning in the thought of an experience and create relationships of meaning, purpose and value of the experience and intellectually in learning will be trained if the teacher invites students to engage in activities to solve problems, analyze the experience, find and filter information , formulate questions ". Repetition or repetition is one of the basic principles of learning. Repetition or repetition is one of the basic principles of learning. Dimyati and Mujiono (2002) suggests that there are three theories that emphasize the importance of repetition, namely the Southwestern Psychological theory, the theory of Psychology Association (koneksionisme), and the theory of Psychology Conditioning. Southwestern Psychological theory stating learn is to train the forces which exist in humans which consists of power gaze, respond to, remembering, imagining, sensing, thinking and so on. Through repetition, the forces will evolve. Theory Psychology Association (koneksionisme) to learn the laws of Thorndike called "law of exercise" revealed that the study is the establishment of relations between stimulus and response, as well as the repetition of the experiences that increase the chances of the emergence of a new response. Psychological theory Conditioning is a further development of koneksionisme also emphasized the importance of repetition in learning. In connectionism, learning is the formation of stimulus and response relationship then in Psychology Conditioning, responses may arise not because only by the stimulus, but also by the conditioned stimulus. Repetition is the repetition of a meaningful deep, steadying the way students are trained through the provision of duty or quiz. With the proper training and repetition will help the process of remembering. Repetition do not mean to do with the form of questions or the same information, but in the form of information that is varied so it is not boring. By giving the matter and assignments, students will be given the information it receives and used to solve the problems.

Based on the above, the problem of research formulated as follows. "Is the learning outcomes of students who are taught mathematics by AIR learning models is better than the results of learning math students taught by direct learning model?"

B. METHODS RESEARCH

This research is a quasi-experimental research and implemented in class VIII SMPN 12 Kendari in the first semester of the 2015/2016 academic year. The study population was all students in grade VIII SMPN 12 Kendari consists of six parallel classes namely VIII1 until VIII6. With purposive sampling technique then set VIII1 class as an experimental class (taught by AIR models) and class VIII2 as the control class (taught by direct learning model).

The variables in this study consisted of independent variables namely AIR learning model (X1) and the dependent variable is the result of learning mathematics students who are taught by AIR learning model (Y1).

The shape of the design in this study are as follows.

Table 1
Research design

Class	treatment	learning outcomes
Eksperimen	T_1	O_1
Kontrol	-	O_2

(Arikunto, 2005)

C. RESEARCH RESULTS

Based on descriptive analysis for the observation of the learning process of teachers with AIR models obtained as follows: Meetings I: 80.95%, Meeting II: 85,71%, Meeting III: 90.47%. So generally, the learning process of teachers with models of AIR for 3 meetings is increasing. While the observation of the learning process of teachers with direct instructional model is obtained as follows: Meetings I: 64.06%, the second meeting: 76.56%, Meeting III: 88.24%. So generally, the learning process of teachers with direct instructional model for 3 meetings is increasing. However, the learning process of teachers with AIR models better than the teacher learning process with the direct learning model.

Descriptive analysis for the observation of student activity by AIR models obtained as follows: Meetings I: 76.19%, the second meeting: 79.76%, Meeting III: 85.71%. So generally, student activities with AIR models during the three meetings was increased. While the observation of student activity by direct learning model is obtained as follows: Meetings I: 76.47%, the second meeting: 82.35%, Meeting III: 84.38%. So generally, student activities with direct instructional model for 3 meeting is also increasing. However, student activities with AIR models slightly increased compared to the student activity by direct learning model.

Based on the results of the test (post-test) on students 'mathematics experimental class taught by AIR models, found that the mathematics learning outcomes of students ranging from grades 54 through 95. The distribution of data values learning outcomes of students' mathematics experimental class can be seen in Table 2, and figure 1 , following.

Table 2
Data Distribution Student Results Class Experiment

No.	Value	Mastery Students Level	Frequency	Percentage
1	$0,00 \leq Y \leq 33,25$	less	0	0
2	$33,25 < Y \leq 58,25$	fairly	3	8,33
3	$58,25 < Y \leq 83,25$	good	30	83,33
4	$83,25 < Y \leq 100,00$	very good	3	8,33
Sum			36	

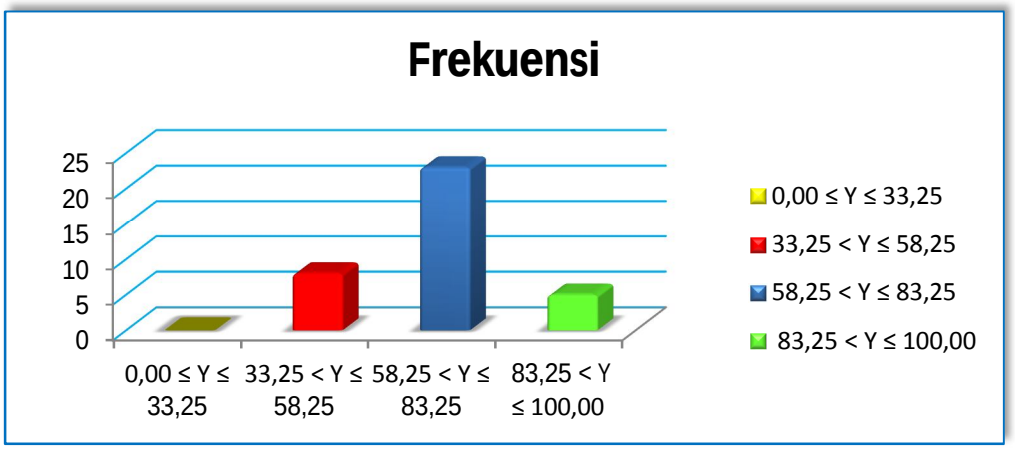

Figure 1. Diagram Data Student Results on the Class Experiment

Based on the results of the test (post test) mathematics in control class taught by direct learning model, found that the mathematics learning outcomes of students ranging from grades 50 to 91. The distribution of the value of mathematics learning outcomes data control class can be seen in Table 3, and figure 2, below.

Table 2
Data Distribution Student Results Class Control

No.	Nilai	Mastery Students Level	Frequency	Percentage
1	0,00 ≤ Y ≤ 33,25	less	0	0
2	33,25 < Y ≤ 58,25	fairly	10	22,22
3	58,25 < Y ≤ 83,25	good	21	63,89
4	83,25 < Y ≤ 100,00	very good	5	13,89
Sum			36	

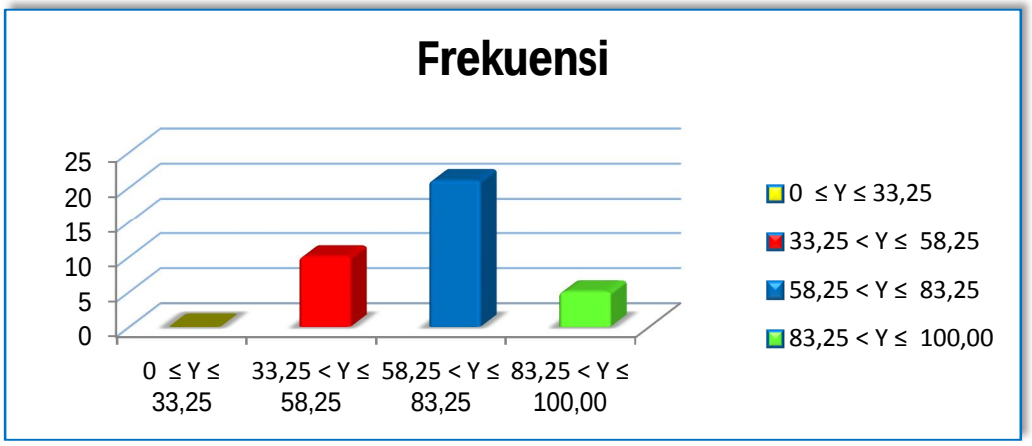

Figure 2. Diagram Data Student Results on the Class Control

Before testing the hypothesis, first tested the normality and homogeneity of variance. This is done for purposes of determining the yag hypothesis test will be used. Normality test is used to determine whether the data is the result of both classroom learning mathematics normal distribution or not. Based on the test results of normality with the Kolmogorov-Smirnov formula, and SPSS 16. The result as table 3 below.

Table 3
Results of Statistical Analysis Normality Test Data Results Math Students
Class Experiments (KE) and Class Control (KK)

One-Sample Kolmogorov-Smirnov Test

		learning outcomes_KE	learning outcomes_KK
N		36	36
Normal Parameters[a]	Mean	72.8611	68.3333
	Std. Deviation	9.71936	11.80799
Most Extreme Differences	Absolute	.134	.121
	Positive	.065	.121
	Negative	-.134	-.100
Kolmogorov-Smirnov Z		.805	.724
Asymp. Sig. (2-tailed)		.535	.672

a. Test distribution is Normal.

In Table 3 above shows that the value Asymp. Sig. (2-tailed) for the experimental class is 0,535> α (with α = 0.05), so H0 is accepted. Thus, it can be concluded that the data of students' mathematics learning in the class experiment normal distribution. As for the class of control, it appears that the value Asymp. Sig. (2-tailed) it is 0.672> α (with α = 0.05), so H0 is accepted. Thus, it can be concluded that the data of students' mathematics learning in the class control normal distribution.

Furthermore, homogeneity is tested to determine whether the data have the same variance (homogeneous) or not. Based Levene test statistic using SPSS 16 result dapatdisajikan in Table 4 below.

Table 4
Results of Statistical Analysis Data Homogeneity Test Results Math Students Experiment Class and Class Controls

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
learning outcomes	Equal variances assumed	1.808	.183
	Equal variances not assumed		

From Table 4 above shows that significant value Levene test statistic is 0.183. Significant value is greater than the significance level of 0.05 (sig. (0.183)> α = 0.05), then H0 is accepted. It concluded that both groups have the same variance. This means that the distribution of data from the study both groups learning outcomes with AIR learning model and direct learning model has the same variance (homogeneous).

Because the normal distribution of data and variance homogeneous then the hypothesis testing using independent samples t test formula (Independent-Samples Test) with SPSS 16, as shown in Table 5, below

Table 5
Result Analysis Hypothesis Test Math Students

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
learning out comes	Equal variances assumed	1.808	.183	1.776	70	.080	4.52778	2.54893	-.55591	9.61147
	Equal variances not assumed			1.776	67.505	.080	4.52778	2.54893	-.55922	9.61477

0 is the results of learning taught by direct learning model.

D. DISCUSSION

The research was conducted on a class VIII SMPN 12 Kendari, with VIII1 class as an experimental class (taught by AIR models) and class VIII2. as the control class (taught by direct learning model).

Based on the observation of the learning process both teachers in the experimental class and control class, generally get good results in the experimental class. It shows that teachers prefer to use AIR models in comparison direct instructional model. This is because the sequences of syntax in AIR models are very detailed and in accordance with the instructional goals of learning. Similarly, with akitivitas good students in the experimental class and control class, generally get good results in the experimental class. This shows that the measures of AIR models easily followed by students. This means sisntaks of AIR models appropriate to developmental level of students so that student activity in the learning process can be increased.

Based on the results of both the experimental class mathematics and classes have the same control both categories. However, the experimental class, it appears that the increase is greater than the control class.

Descriptive analysis with SPSS 16 obtained processed data result of learning mathematics experimental class and control class can be seen in Table 6 below.

Table 6
Analysis Results Description Student Results
Experiment Class and Class Controls

Statistics

		learning outcomes_KE	learning outcomes_KK
N	Valid	36	36
	Missing	0	0
Mean		72.8611	68.3333
Median		72.5000	69.0000
Mode		72.00	52.00
Std. Deviation		9.71936	11.80799
Variance		94.466	139.429
Minimum		54.00	50.00
Maximum		95.00	91.00

Based on the results of the descriptive analysis of the results of the experimental study mathematics at grade values obtained an average of 72.86 with a standard deviation of 9.72. As for the control class values obtained an average of 68.33 with a standard deviation of 11.81. The average value obtained in the two groups showed that the value of 72.86 represents a value of 36 students in the experimental class and the value of 68.33 represents a value of 36 students in the control class. The minimum value of the experimental class is 54 and the maximum value of 95 with a median or middle value of 72.00, mode or values that often appear is 72, and the variance of 94.466. As for the class gained control minimum value of 50 and a maximum value of 91 with a median or middle value of 69.00, mode or values that often appear is 52, and the variance of 139.43.

E. CONCLUSIONS

Based on the above results can be summarized as follows.

1. The results of mathematics learning taught by AIR models: the average value of 72.86, standard deviation of 9.72, 54 minimum value, maximum value of 95, the median 72.00, mode 72, and the variance of 94.466.
2. The results of students' mathematics learning taught by direct learning model: the average value of 68.33, the standard deviation of 11.81, the minimum value of 50, the maximum value of 91, the median 69.00, mode 52, and a variance of 139 , 43.
3. The results of students 'mathematics learning taught by AIR models better than the results of students' mathematics learning taught by direct learning model.

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