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RESEARCH ARTICLE

EFFECTIVENESS APPLICATION OF AUDITORY INTELLECTUALLY REPETITION (AIR) LEARNING MODEL TO IMPROVE STUDENT'S LEARNING OUTCOMES ON SUBJECT TWO-DIMENSIONAL AND THREE-DIMENSIONAL SHAPES

Ni Made Asih and Desak Putu Eka Nilakusmawati.
Mathematics Department, Faculty of Mathematics and Natural Sciences, Udayana University, Kampus Bukit Jimbaran, Badung-Bali, Indonesia.

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Abstract

The application of appropriate learning models is one key to the success of a learning process. The purpose of this study was to determine the effectiveness of the application of Auditory Intellectually Repetition (AIR) learning models in improving student's learning outcomes on subject two-dimensional and three-dimensional shapes. This study uses participatory action research, with model of action research design. The data source are elementary school students grade V SDN 5 Keramas, Blahbatuh, Gianyar–Bali and the procedure is designed in three cycles of action. The findings from the t-test suggest that AIR learning model effectively implemented to improve student's learning outcomes in mathematics subject on two-dimensional and three-dimensional shapes. The average percentage improving student's learning outcomes between early action and action cycle 3 by 60.47 percent.

Introduction:-

Education occupies a very important position in improving the quality of human resources in the mastery of science and technology, so that the quality of education must be improved. One effort to improve the quality of education is through improving the quality of learning. Evaluation of learning outcomes as a basis of diagnosis disadvantages and advantages of students and its causes need to be used as a basis to organize the development of learning activities to improve student learning outcomes. A teacher must have a strategy and appropriate learning models, especially in communicating with students (Dimyati and Mudjiono, 2002). Sanjaya (2010) states that a teacher also must have the ability to choose and use methods and media as a teaching aid. Teachers as educators who provide knowledge and skills to students has a role as a source of learning, manager, demonstrator, facilitator, motivator and as an evaluator in achieving progress in learning.

Real conditions in most of the elementary schools, shows student achievement for mathematics courses from year to year showed a low score of achievement. The classic problem of the low in this math scores due to low mastery of basic concepts and their misconceptions experienced by elementary school students in general. This is evident from the results of daily tests math lessons per subject always below than average of other subjects, especially the subject of geometry. In spite of conditions mentioned above, the determination of learning method is very important to be done in an effort to improve student learning outcomes in mathematics, which come from the quality of the learning

Corresponding Author:- Ni Made Asih.
Address:- Mathematics Department, Faculty of Mathematics and Natural Sciences, Udayana University, Kampus Bukit Jimbaran, Badung-Bali, Indonesia.

process. One way to do is by learning innovation. The study on the implementation of Auditory Intellectually Repetition (AIR) learning model becomes very necessary to do.

The purpose of this study was to determine the effectiveness of the application of Auditory Intellectually Repetition (AIR) learning models in improving student's learning outcomes on subject two-dimensional and three-dimensional shapes. This research is important because by knowing the effectiveness of the implementation of this approach will be able to make a recommendation to educators to improve student learning outcomes through more innovative and quality of learning.

According Ngalimun (2013), AIR learning model similar to the model of learning Somatic Visual Auditory Intellectually (SAVI) and Visual Auditory Kinetic (VAK), the difference is only in repetition, ie repetition that has meaning deepening, expansion, consolidation by way students are trained through the provision of duty or quiz. The theory that supports AIR learning model is a behavioral psychology and mathematics learning approach based on constructivism. According to Thorndike (1999) suggests the law of exercise which basically states that the stimulus and the response will have a relationship with each other stronger if the frequent repetition. Constructivist approach emphasizes that upon learning of mathematics the most important is the learning process of students, teachers as facilitators who guide the students, straightening, and complements so construction of student's knowledge have become correctly.

AIR learning model consists of three aspects, namely: (a) Auditory, learned by talking and listening, listening, presentation, argumentation, express opinions, and responding. Teachers should be able to conditioning the students in order to optimize the ear senses, so that the connection between the ear and the brain can be used optimally. In the process of learning activities mostly student interaction with teachers conducted with oral communication and involves the senses ears. One of the activities that can support the auditory is to form students into several groups and then each group was asked to show the results of discussions in turn. In the presentation, there is a group who speak and there are also groups that listen, so auditory implemented; (b) Intellectually, activities internally students' minds when they use intelligence to reflect on their experiences. Meier (2002) explains that this aspect will be trained intellectually in learning if the teacher invites students to engage in activities such as solving problems, analyzing experience, working on creative planning, generate creative ideas, find and filter information, formulate questions, create mental models, implementing new ideas at work, creating personal meaning, and predict the implications of an idea. This shows that intellectually is the creator of meaning in thinking; (c) Repetition, repetition is required in learning, so that deeper and broader understanding. According Trianto [6], the entry of information into the brain received through the sensing process will enter into short-term memory. Therefore, with the expected repetition of such information transferred into long-term memory. Repetition do not mean the type of question 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 accustomed to mathematical problems.

Research Methods:-

This type of research is action research participant, because the researchers directly involved in the research process from the beginning to the end of the study. This research involves teachers as practitioners, so as to resolve the problems occurred collaboration between teachers and researchers. The study design using the design model of action research.

The study was conducted in primary school SDN 5 Keramas, Blahbatuh Gianyar - Bali. Implementation of the overall study carried out for six months, while the implementation of the provision of treatment of the application of Auditory Intellectually Repetition (AIR) learning models conducted over four months.

Data:-

The data source of this research are elementary school students grade V SDN 5 Keramas, Blahbatuh, Gianyar – Bali, with subject two-dimensional and three-dimensional shapes. Data was collected through tests, interviews, and observations. The test is done to see students 'conceptions about the concept of two-dimensional and three-dimensional shapes made before given learning and to assess changes in students' conceptions after following study.

Tests were also conducted on the results of the performance of the student in completing the tasks given. The results of students' work on any test or assignment given will be explored through interviews, to get a much richer picture of the development of the understanding or difficulties experienced by students in learning, expressing ideas and feelings. While the observation is used to document events during learning activities. Observations contain a

description relating to the activities of teachers, student activities, as well as the circumstances during the learning takes place.

Statistical Analysis:-
Furthermore, to determine whether there is an increase in student's learning outcomes after the implementation of AIR learning model, evaluated by statistical techniques with t-test. Statistical analysis by t-test was used to test scores of students before and after the learning action. The hypothesis tested is:
H_0 : $\mu_1 = \mu_2$ (No increase of student's learning outcomes in the subject of two-dimensional and three-dimensional shapes after application of AIR learning models)
H_1: $\mu_1 < \mu_2$ (There is an increase in student's learning outcomes in the subject of two-dimensional and three-dimensional shapes after application of AIR learning models)

The research hypotheses were tested by t-test for paired samples (paired sample t test), with a significance level of 5%. Paired t-test was used to test two samples in pairs, whether it has an average that are significantly different or not. Ho will be accepted if value of t is greater than t table with $\alpha = 0.05$ and Ho is rejected if the reverse (Walpole, 1995).

Implementation Procedures:-
Procedure implementation of classroom action research conducted refers to the model of Kemmis and Taggret (1988). This study begins by conducting early reflections. At this stage provision of the test and continued with the interview to the students, in order to obtain a clear picture of students' conceptions regarding the two-dimensional and three-dimensional shapes, then do summarize the data obtained as a basis to define and formulate learning design.

The next step is the planning stage, the implementation phase, the stage of observation, and reflection. The procedure of action research is designed in three cycles of action, in each cycle was conducted for one month. At the end of the cycle of actions carried out monitoring and evaluation, hereinafter the evaluation results are reflected to plan their next action.

Results and Discussion:-

Description of Student Learning Outcomes:-
Score of mathematics learning outcomes in early action, it turns out of 27 students in one class, all remained below the value of 65 of the value of minimum completeness criteria. This proves that the student's mastery on the subject of two-dimensional and three-dimensional shapes is still low. Furthermore, all of these students will be the case in this study. Description of the average student's learning outcomes after obtaining AIR application method for the three cycle, based on aspects of auditory, intellectually, and repetition are presented in Table 1.

Table 1:- Average of Student Learning Outcomes Based on AIR Aspects.

AIR aspects	The average score of student learning outcomes		
	Cycle 1	Cycle 2	Cycle 3
Auditory	72,45	73,40	85,10
Intellectually	75,00	75,88	88,85
Repetition	76,14	78,00	89,00
Average	74,53	75,76	87,65

Table 1 illustrates that the auditory aspect increased by 14.69% from 72.45 on the actions of cycle 1 into 85.10 in cycle 3, Aspect intelectually increased by 18.46%, from the score of 75.00 on action cycle 1 become 88.85 in cycle 3, while aspects of repetition increased by 16.89% from 76.14 in cycle 1 become 89.00 in the action cycle 3. This indicates that the overall aspects of implementing the method AIR has been able to improve learning outcomes of elementary school fifth grade students of SDN 5 Keramas, Blahbatuh Gianyar.

Table 2:- Percentage Increase in Student's Learning Outcomes.

Student's number	Scores of learning outcomes			Percentage increase		
	Cycle 1	Cycle 2	Cycle 3	Cycle 1 & Cycle 2	Cycle 2 & Cycle 3	Cycle 1& Cycle 3
1	77.78	77.78	77.78	0.00	0.00	0.00
2	77.78	77.78	77.78	0.00	0.00	0.00
3	66.67	66.67	77.78	0.00	16.66	16.66
4	77.78	77.78	88.89	0.00	14.28	14.28
5	77.78	88.89	100.00	14.28	12.50	28.57
6	77.78	66.67	88.89	-14.28	33.33	14.28
7	77.78	77.78	88.89	0.00	14.28	14.28
8	77.78	66.67	88.89	-14.28	33.33	14.28
9	55.56	77.78	88.89	39.99	14.28	59.99
10	90.00	90.00	100.00	0.00	11.11	11.11
11	88.89	88.89	100.00	0.00	12.50	12.50
12	66.67	66.67	88.89	0.00	33.33	33.33
13	55.56	66.67	88.89	20.00	33.33	59.99
14	88.89	88.89	88.89	0.00	0.00	0.00
15	88.89	88.89	100.00	0.00	12.50	12.50
16	77.78	66.67	88.89	-14.28	33.33	14.28
17	88.89	77.78	88.89	-12.50	14.28	0.00
18	55.56	77.78	88.89	39.99	14.28	59.99
19	88.89	77.78	88.89	-12.50	14.28	0.00
20	66.67	66.67	88.89	0.00	33.33	33.33
21	66.67	66.67	77.78	0.00	16.66	16.66
22	66.67	66.67	77.78	0.00	16.66	16.66
23	55.56	66.67	77.78	20.00	16.66	39.99
24	55.56	66.67	77.78	20.00	16.66	39.99
25	77.78	66.67	77.78	-14.28	16.66	0.00
26	77.78	77.78	88.89	0.00	14.28	14.28
27	88.89	100.00	100.00	12.50	0.00	12.50
Average	74.53	75.76	87.65	3.13	16.61	19.98

Based on the results in Table 2 above, when compared between cycle 1 and cycle 2, there were 7 students increased their learning outcomes, 14 students did not increase, while 6 students has decreased. However, when viewed as a whole, increased of student's learning outcomes that are not so great, that only 3.13%, an increase from the average value of 74.53 in cycle 1 to 75.76 in cycle 2. Based on the learning outcome is not so great in 2nd cycle, then the third cycle needs to be done.

Improving student learning outcomes between cycle 2 and cycle 3 shows the percentage increase of 16.61% from the average score of the learning outcomes 75.76 in cycle 2 to 87.65 in cycle 3. Similarly, if the student learning outcomes on the subject of two-dimensional and three-dimensional shapes, when compared between cycle 1 and cycle 3, obtained improvement of learning outcomes by 19.98%, an increase from an average of 74.53 in cycle 1 to 87.65 in cycle 3. Student learning outcomes between the pre-action and action cycle 3, obtained a percentage increase of 60.47%, of the average value of 54.62 in the pre-action became 87.65 on action cycle 3.

If the score of student learning outcomes are categorized into four categories, namely less, Enough, Good, Excellent, the percentage distribution of students according to the category of learning outcomes are presented in Table 3.

Table 3:- Percentage Distribution of Students Learning Outcomes

Scores Test	Category	Distribution of scores of student learning outcomes					
		Cycle 1		Cycle 2		Cycle 3	
		N	%	N	%	N	%
≥80	Excellent	7	25.92	6	22.22	19	70.37
70 - <80	Good	10	37.04	9	33.33	8	29.63
56 - <70	Enough	5	18.52	12	44.44	0	0.00
<56	Less	5	18.52	0	0.00	0	0.00
Total		27	100	27	100	27	100

The percentage distribution of students' scores by categories of learning outcomes of the three cycles seen that the first cycle of the percentage of students who are in the category of less and enough by 18:52%, the majority of students (37.04%) in the good category, and only 25.92% in the category excellent. In the second cycle of student learning outcomes spread in the category enough, good, and excellent, while students with less learning outcomes category no longer exists. At the end of the third cycle, the majority of student learning outcomes (70.37%) achieved excellent category, 29.63% good category, and no student learning outcomes in the category of less and enough.

Effectiveness Application of AIR Learning Model:-

The improvement of students learning outcomes is an indicator of the implementation of an effective learning method. To determine whether there was an increase in the students' learning outcomes at SDN 5 Keramas, Blahbatuh Gianyar on the subject of two-dimensional and three-dimensional shapes after the application of AIR method, evaluated by using one group pretest-posttest design.

Testing whether there is an increase in students learning outcomes then performed hypothesis testing with paired sample t-test, with a significance level set at 5%. The paired t-test aims to test whether two paired samples have a significantly different average or not.

Tabel 4:- Paired Samples Statistics.

		Mean	N	Std. Deviation	SE Mean
Pair 1	Cycle 1	74.5293	27	11.91300	2.29291
	Cycle 3	87.6556	27	7.75450	1.49237

Paired sample statistics in Table 4 shows the mean of student's learning outcomes in cycle 1 is 74.5293 and at cycle 3 was 87.6556, for a sample of 27 students. Correlations between scores of student learning outcomes in cycle 1 and cycle 3 obtained value 0.525 with a probability of 0.005 smaller than 0.05. This shows that the correlation between the scores of learning outcomes in cycle 1 and cycle 3 was significantly correlated.

Table 5:- Results of Paired Sample t Test for Scores of Student Learning Outcomes

Paired Samples Test			
			Pair 1
			Score cycle 1 – Score cycle 3
Paired Differences	Mean		-13.12630
	Std. Deviation		10.24771
	Std. Error Mean		1.97217
	95% Confidence Interval of the Difference	Lower	-17.18015
		Upper	-9.07244
t			-6.656
df			26
Sig. (2-tailed)			.000

Based on t test results, obtained probability is 0,000, because the probability <0.05 then the decision is to reject H_0 or H_0 accepted, so it can be concluded that the average results of students of class V SDN 5 Keramas, Blahbatuh Gianyar on the subject of two-dimensional and three-dimensional shapes after application of the method of AIR in cycle 1 and cycle 3 was significantly different. Means that the average student learning outcomes in cycle 1 differ significantly from the average of learning outcomes in cycle 3. Once applied AIR learning model, learning outcomes

of students has increased significantly in the third cycle compared with the cycle 1. It can be concluded that the application AIR learning model effectively to improve student learning outcomes on the subject of two-dimensional and three-dimensional shapes on the fifth grade students of SDN 5 Keramas, Blahbatuh Gianyar, Bali.

Conclusions:-

The application of AIR learning models can increase the average student's learning outcomes of 54.62 in early action becomes 74.53 in cycle 1, 75.76 in cycle 2, and 87.65 in cycle 3. The average percentage improving student's learning outcomes between early action and action cycle 3 by 60.47 percent.

Elementary school student learning outcomes on the subject of two-dimensional and three-dimensional shapes have increased significantly after the application of Auditory Intellectually Repetition (AIR) learning models in the three cycle of action research conducted. AIR learning model application effectively to improve student learning outcomes in the subject of two-dimensional and three-dimensional shapes on the fifth grade students of SDN 5 Keramas, Blahbatuh Gianyar, Bali.

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