



Applying *Auditory Intellectually Repetition (AIR)* Model in Cell Material for Student Result

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Abstract

The purpose of this study to describe of applying *Auditory Intellectually Repetition (AIR)* model in cell material for students result. This study used Quasy Experimental research by Non-Equivalent Control Group design. Sample is determined by convinience sampling, that is class XI MIA 3(control class) and XI MIA 4 (experimental class). The result of this research show that learning using AIR in experimental class is higher than with control class. Analysis of pretest and posttest examine t of tcount 7,426>ttable 1,988 with significant level 0,05, so it can difference of increase study result in both class. Examine N-Gain experimental class 84% in high category, and control class 41% in middle category. Examine t average N-Gain tcount 4,80>ttable 1,988. Analysis student activities in experimental class is higher than control class which has percentage of very active and active criterias for experimental class 93.18% and 78.57% for control class. Analysis of psychomotoric study result in experimental class is 14% in excellent category, 84% in good category, whereas control class gets persentage 5% in excellent category and 71% in good category. Very good level of implementation AIR model with in average 86%. Teachers and students also respond very well to AIR. The conclusion of this study results was apply AIR model in cell material positive effect for student result.

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INTRODUCTION

Quality national education can be seen from the quality output that can be seen from graduated quality high school which are recognized at the national, regional, and international levels. According Sari (2012) educational achievement student in Indonesia can be said to be low, which will result in the gap of scientific progress with education world. Low student achievement in Indonesia due to learning still tends to focus in textbook, must the student active in study, not only copy or follow examples without know the mean (Effendi 2012).

Effort to improve quality national education with to improve quality learning process (Tjalla 2013). Quality of learning process the teacher did is one of the important factors which determines the success of student learning. According Nurhayati (2006) in the operational level, teacher are the determinants of educational success through performance and professional. According Junianto (2013), teacher teaching performance represent around 67,51% from the success of learning activities. Quality education according UNESCO it is the combination of professional teacher with integrity and competence (Mustafa 2013). Characteristics of teacher who are said to be successful in learning is teachers who master a number of teaching skills, especially the teaching models as a means to encourage student involvement in the learning process and improve learning outcomes (Trianto 2009).

Learning model *Auditory Intellectually Repetition* (AIR) can be used as an alternative learning strategy in the class to improve student activities. According Linuwih & Sukwati (2014) learning model *Auditory Intellectually Repetition* (AIR) is a cooperative learning model to improve student activeness and also can motivate student to improve learning achievement. According Isjoni (2010) cooperative learning is a learning model in which student learn and work in small groups to work together to help construct concepts and solve the problem its members 4-6 student with heterogeneously. Learning model AIR can be foster student communication in the class so student play an active role in the class (Widyastuti *et al.* 2014).

Model AIR based learning model is learning construction (Purnamasari 2013). Learning constructivism is the process by which students are actively involved build system of meaning and student interaction (Slavin 2005). In learning model AIR teacher only act as facilitators who direct student, straighten and complete so that the construction of the knowledge that student have is correct. Success in learning activities if student are able to construct and develop the concept independently (Burhan *et al.* 2014).

One of the materials that can be applied to the AIR Learning model is cell material which is the material in grade XI of the gasal semester. Student consider cell material to be a difficult subject to learn because many concepts are abstract. Student find it difficult to absorb new terms. Student tend to memorize abstract concepts so that students understanding of concepts is low. According Susanto *et al.* (2012) cell material has many terms and is concerned with understanding the concepts of biology so students have difficulty in understanding it.

Based on observations and discussions with biology teacher in SMA Negeri 1 Jakenan biology learning activities using lecture, diskusi and presentation methods. The discussions activities conducted are still the transfer of knowledge from teacher to student. Teacher also have used learning media such as powerpoint and video to support learning activities. But there are still many students who are less active in learning activities, so that learning seems to be teacher centered. Besides the student activity is still relatively low in terms of asking and answering question given by the teacher only a few students are active in learning. There are still many students who have an average score below KKM. Seen from the result of study 41 students, 19% students reached the value above KKM (>72), 24% students reached the value with KKM (=72), and 57% students have value under KKM (<72).

Based on the background needed an effort to determine the influence of AIR learning model that can increase student activities such as solving problems, discussions and presentations. AIR learning model includes activities that encourage that activity of the senses and students activities. According Huda (2013) there are three aspects in the AIR learning model that is Auditory (listening), Intellectually (understanding), Repetition (repetition). Auditory meaning that learning must be through listening, seaking, presentation, argumentation, expressing opinions, and responding. Intellectually meaning that learning should be use the ability to think (minds-on) means the ability to think should be trained through reasoning, investigating, solving problems, identivy problems and apply. Repetition which means meaningful repetition of deepening, expansion, stabization by means of students trained through assigment or quiz (Hasnawati *et al.* 2016). Based on the above problems, it is necessary to research applying *Auditory Intellectually Repetition* (AIR) model in cell material to the result of the student in class XI SMA Negeri 1 Jakenan.

RESEARCH METHODS

Research conducted in SMA Negeri 1 Jakenan in the even semester of the school year 2016/2017. Design used in this research is *quasi experimental design* with type *nonequivalent control group design*. The samples used were two classes, one experimentak class and one control class. Sampling is determined by technique *convinience sampling*. Data collected by test method, observation, questionnaire, and interview. Test methods are used to measure students cognitive learning outcomes in cell matter in the form of questions *multiple choice*. Test questions heve been tested for validity, reliability, difficully and dissingushing power. Test questions are given at the beginning as a *pretest* and ending the meeting as *posttest*. Observation method is used to acces student activities and psychomotorics in the learning process. The questionnaire method used to acces students responses and learning effectiveness. Learning in the experimental class by using the *auditory intellectually repetition* (AIR).

In this study, the steps of learning are done refering to Shoimin (2016) with the following modification: (1) Student are divided into several heterogeneous groups, each consist of over 4-5 students; (2) Student listen and pay attention to the explanation of the teacher; (3) A group discussed about to the video of the cell material that the teacher showed student paired in pairs discuss and then students present in front of the class (*auditory*); (4) During the discussion, student get question or problems related to the material; (5) Each group thought about how to apply the result of the discussion and can improve their ability to solve problems (*intellectually*); (6) After finishing the discussion, student get repetition of the material by following the *Quick and Smart* quiz in groups (*repetition*); (7) At the end of group learning which gets the highest point get reward form of stationery. Learning in the control class with lecture, discussion and question and answer methods.

Interview methods are used to assess teacher responses to the applicaton of AIR methods. Analysis of research data in the form of the student cognitive test result and the result of aspect of psychomotor activity and quantitative descriptive execution. The result of student and teacher responses are analyzed descriptively qualitatively.

RESULT AND DISCUSSION

Result student qognitive learning on cell material learning using AIR model were obtained from *pretest* and *posttest* value. The value of pretest aims to determine the level of initial ability of student before being given a learning activity while the posttest value is used to determine the improvement of students understanding. The result of the retest value in the normality test, homogeneity, t test the difference of two average to see if the experimental class and control class

start from the same conditions, and the *N-Gain* test to determine the improvement of student learning outcomes. Tabel 1 indicates that the pretest grade of the experimental class student with the control class is not much different, but the classical experimental class osttest value is better than the control class.

Tabel 1 The *pretest* and *posttest* values of the experimental and control values

Average value	Experimen class (44 student)	Control class (42 student)
<i>Pretest</i> Value	60,9	61,3
<i>Posttest</i> Value	79,8	71,1

This provides that the application of the AIR model to the experimental class make a positive contribution to the experimental class. In the student experiment class more anthusiastic and active in following the learning, this is because in the AIR model learning there are three phases must be done by student it is *auditory, intellectually, repetition*. First phase it is *auditory* (listening) student optimize their ear senses to listen to information both from the teacher and from friends.

In the early stages, the teacher guides the experimental class students to carry out the auditory phase. Where before learning begins. The teacher stimulates the students initial knowledge by displaying a material cell video that lasts for 3 minutes. After the video is shown the teacher asks the students to discuss in pairs. It aims to mutual opinion, argue and train students learn to talk or communicate, then the teacher asked one of the group representatives to conclude the video. The teacher must be able to condition the student to optimize the senses of his ears, so the connection between the ear and the brain can be utilized optimally. In learning activities most of the proses of student interaction with teachers is done with oral communication and involves the ear sunses.

In the *auditory* phase student involved more actively this is related to learning information processing and constructivism learning so the students more deeply understand the cell material. Processing information at the *auditory* phase when student are informed from videos captured through the senses of the listener (ear) and sense of vision (eye). The earliest information received by the ears and eyes is not all can be processed due to the limited ability and the amount of incoming information, and changed in the form of a signals stimulus. Stimulus that receive students through the senses of the listener (ear) and sense of vision (eye) will be saved on *short term memory* and if there is a continous loop going into *long term memory*.

The *auditory* phase also includes *constructivism* learning. Constructivism learning is a process whereby students actovely build system of meaning and understanding of reality through student experience and interaction Slavin (2005). On learning constructivism students are guided to process information provided independently. Student understand the material and build meaning by combining new information with previously known information independently. Thus the learning model constructivism will give a personal meaning through prior learning and personal experience which will be different for each student (Nugroho 2010).

The second phase is *intellectually* (construct meaning) student discuss, opinion, and complete the LDS in groups. In *intellectually* phase student discuss in groups, in this phase students reconstruct the result of information processing and constructivism simuktaneously. Information processing that takes place in the *intellectually* phase it is the process of meaning in the brain of student to the information learned. Crew of constructivisme approach to cognitive conflict in brain it is students receive new information and will be integrated with information previously obtained in the *auditory* phase. In the *intellectually* phase students are given the opportunity to inbvestigate and discover concepts through practicumactivities and group discussions. Students are trained to be accustomed to arguing on a firm basis in accordance with previously acquired knowledge.

According Burhan *et al.* (2014) the *intellectually* succesful aspects of learning if teachers invite students to be actively involved in activities such as solving problems, analyzing experiences, doings creative planning, creating creative ideas, searching and filtering information, formulate questions, creat mental models, apply new ideas to work, creat personal meaning, and predicted the implications of an idea. This shows that intellectually are creator of meaning in thinking so as to improve student learning outcomes.

After discussing the students presenting the results of the discussion. At the presentation stage students are given time to ask each other questions and responds to be discussed together and guided by the teacher. When students provide an explanation of the results of their discussion and supplemented by teacher reinforcement, students will develop a new understanding of the concept of the cell material being studied.

The third phase of repetition (repetition) material consolidation done by interesting with the provision of quiz Quick and Smart. Each child is actively involved in the implementation of the Quick and Smart quiz because each student has the responsibility of being a group representative to move forward to the class in answering questions in turn. The three phases increase the students' activities and understanding so as to influence the improvement of student learning outcomes. According to Suherman (2003) if repetition processes are frequent, the relationship between the stimulus and the response will be automatically stronger, with frequent repetition increasing the students' understanding of the material. This is in accordance with the results of research Fauzi & Atiek (2015) stated that the activities and understanding of students through the AIR learning model in learning increases in each cycle. Based on the analysis of cognitive learning outcomes there was a significant difference between the experimental and control classes obtained on the basis of t-test the average difference presented in Table 2.

Tabel 2 T test results of the mean differences of the experimental and control classes

Class	Average	Dk	T _{test}	t _{table}	information
Eksperimen	79,8	44	7,426	1,988	There is a significant difference
Kontrol	71,1	42			

Table 2 shows that there is a significant difference between students' learning outcomes (posttest) using the AIR model. Thus it can be stated that learning by using AIR model has a positive effect in the learning of cell material. This is in accordance with the results Rosidah study (2016) which states that the AIR learning model has an effect on improving student learning outcomes. Increased student learning outcomes of cognitive competence were obtained based on the N-Gain test. The comparison of the increase of the N-Gain test on the experimental class and control class is presented in Figure 1.

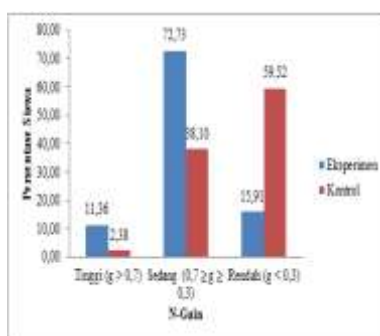


Figure 1 Comparison of N-Gain test increase in the experimental class and control class

It shows that the achievement of N-Gain experimental class is better tested N-Gain on AIR learning model in experiment class higher than control class that use conventional method. It shows that the achievement of N-Gain experimental class is better tested N-Gain on AIR learning model in experiment class higher than control class that use conventional method.

Student activity result is obtained from observation of student attitude during learning and student activeness when discussion and presentation. Assessment is done using student observation sheet completed with assessment rubric. Presentation of data of learning activity value of experiment and control class student can be seen in Table 3 and Table 4.

Table 3 Student activity of the experimental class

Value range (%)	Activity criterion	Percentage of experiment class
81% - 100%	Very active	7 (15,90%)
61% - 80%	Active	34 (77,28%)
41% - 60%	Self active	3 (6,82%)
21% - 40%	Less active	-
< 21%	Not active	-

Table 4 Student activity of the control class

Value range (%)	Activity criterion	Percentage of control class
81% - 100%	Very active	4 (9,53%)
61% - 80%	Active	29 (69,04%)
41% - 60%	Self active	9 (21,43%)
21% - 40%	Less active	-
< 21%	Not active	-

Based on Table 3 and Table 4, student activity with AIR model is better than control class. Based on the results of research average percentage of learning activities of experimental class students who entered the criteria is very active at 15.90% and who entered the active criteria of 77.28% while for the control class average percentage of students who enter the criteria is very active only 9, 53% and which entered the active criteria 69.04%. The attainment of the level of student learning activity in the experimental class in highly active and active criteria shows that learning by applying AIR learning model to cell material is more effective in improving student learning activities compared with direct learning in discussions and lectures applied to control classes.

Therefore, the AIR model has a positive effect on student learning outcomes. The average of students' affective learning outcomes in the experimental class is higher than the control class, probably because students in the experimental learning class with the AIR model invite students to take an active role in learning. Through the many activities undertaken by students during the learning process can further improve students' understanding of the material, because students get direct experience in learning.

In contrast to the control class students tend to rely on diligent friends and better understand in the discussion and presentation in front of the class. This causes uneven distribution of tasks among members. As a result, the results of the activities and learning outcomes of the control class students were lower than in the experimental class. This is in line with the results of research from Wahyuni et al. (2013) that students with high learning activities have better learning outcomes than students with low learning activities.

Psychomotor learning result in this research is skill of doing practicum on material difference of animal cell and plant cell. Psychomotor assessment of students aims to find out

psychomotor students at the time of learning. The result of activity analysis of control class and experiment class is presented in Figure 2 and Figure 3.

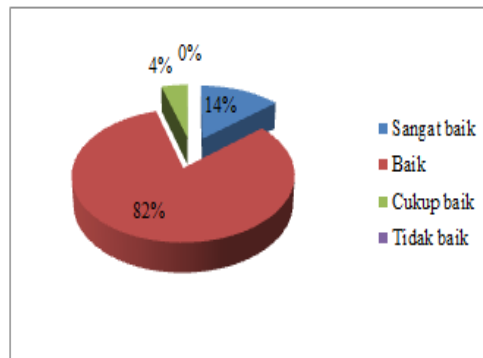


Figure 2. Psychomotor analysis results of experimental class students

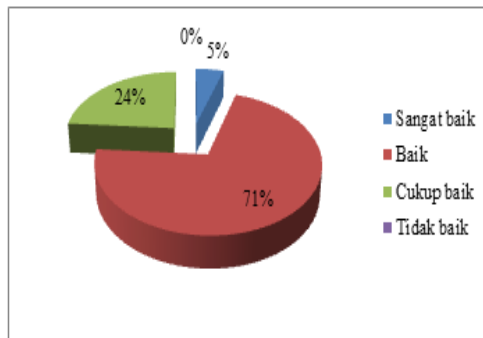


Figure 3. Psychomotor analysis results of control class students

According to Figure 2 and Figure 3 the psychomotor results can be concluded that the experimental class is more active than the control class. This is because in the experimental class the readiness of students in understanding the concept of the material more deeply and meaningful so that the students in the experimental class more enthusiastic active in activities and psychomotor activities while for the control class with lecture and discussion methods to make students more memorize so that the material readiness and understanding of the concept of the material Cells are poor, resulting in less active activity and psychomotor activity. This is in accordance with Imamah (2012) that individual readiness as a student in learning will determine the quality of student learning and achievement.

The analysis results of the implementation of AIR model in the control class goes very well. This is because at the time of teaching the teacher appropriately apply the phases on the AIR model. The results of the analysis are presented in Table 4.

Tabel 4 Result of analysis of the implementation of AIR model

Criteria	Value	Criteria
1	90	Very good
2	85	Very good
3	80	Good
4	90	Very good
Average	86,25	Very good

Results of student responses to the AIR model are obtained from Questionnaires distributed to experiment class students at the end of the lesson at the last meeting. Overall, students give a good assumption about the learning activities that are applied, but there are some

students who give sufficient response to the learning process in the class. Students' responses to the experimental classes of every aspect all fall into excellent category. A total of 97.7% of the students agreed that the students were more interested in discussion during the learning using the AIR model and as many as 93.2% of students agreed with the statement that the AIR model helps the students in understanding the cell material.

Based on the teacher's response to cell material learning with AIR learning model in line with teacher's response to the application of AIR model, the teacher responds well to the learning because the students become more active and easier in receiving the material. This can be seen from the answers of the teacher interview results that mostly provide a positive answer. Teacher difficulties in applying AIR learning model one of them takes a long time.

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