

SE-020

**THE EFFECT OF PREDICT OBSERVE EXPLAIN STRATEGY (POE) ON STUDENTS
ACTIVITY AND LEARNING OUTCOME ON HUMAN RESPIRATORY SYSTEM SUB
TOPIC IN GRADE XI SCIENCE PROGRAM AT SMA NEGERI 15 MEDAN
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Suyedi Hendra Yanto^{1*} and Syahmi Edi¹

¹State University of Medan, Medan

*E-mail: hendra.suyedi@gmail.com

ABSTRACT

This research aims to find out the effect of POE Strategy on students' activity and learning outcome in biology lesson specifically on human respiratory system sub topic. There were 2 classes chosen as the sample by applying cluster random sampling technique that obtained the each sample 38 students for experiment and control class. Experimental class was taught by POE strategy while control class was taught by conventional strategy. The instruments used to obtain the data were cognitive test in form of multiple choices as test instrument and observation sheet as non-test instrument. The research result of hypothesis test for posttest showed that $t_{\text{count}} = 8.76 > t_{\text{table}} = 2.38$ at the level significance of 0.01, means that H_0 is rejected and the H_a is accepted. It can be concluded there is a significant difference of student learning outcome between POE and conventional strategy. Then, t-test of observation results showed that students' activity in both classes is significantly different. The students in experiment class were more active than students in control class by the average score of 80.56 and 50.05 respectively.

Keywords : *learning outcome, students' activity, predict observe explain (POE)*

INTRODUCTION

In general the purpose of teaching is to make the learning materials are delivered fully mastered by all students. It can be known from learning outcomes. Whether or not a goal of learning is strongly influenced by the teaching strategy that employed by teachers.

David (in Sanjaya, 2008) states that learning strategies can be defined as a plan that contains a series of activities designed to achieve specific educational goals. Further described, learning strategy is a learning activities which should be done by teacher and student, so that learning objectives can be achieved effectively and efficiently Kemp (in Sanjaya, 2008). Teachers as educators should always choose the most appropriate learning strategy, which is considered more effective than other strategies so that the skills and knowledge provided by the teacher that really belong to the students. The more appropriate startegy is expected to more effective the expected achievement of learning objectives.

Researcher got educational problem in learning process from his experience when carried on Teaching Practice Program (*Program Pengalaman Lapangan*) in SMA Negeri 2 Balige. The learning strategy that was applied in learning process of biology class was less of

variety or more often used lecturing strategy, this condition caused the class was still ineffective and less innovative to improve the students' learning outcomes in the learning process, because in the lecturing process the teacher was explaining the learning material in verbally, students were listening to the teacher's explanation.

In line with the research from Debby Aruni research in Grade XI Science Program at MAN Gandekan Bantul whole semester of academic year 2012/2013 with used POE strategy in the respiratory system topic. The Aruni research shows, there are effect of POE strategy in the student's interest and learning outcome, for the learning interest got result stastic value 75.50 by Mann Whitney test and students learning outcomes by *t-test* 3.610.

Based on the problems of the preliminary survey analysis conducted in SMA Negeri 15 Medan the data obtained by researcher about the biology learning outcomes of students in grade XI science program on the odd semester academic year 2013/2014. The number of students that fulfill the score criteria of minimum completeness (KKM) 75 on odd semester examination only 30 % in grade eleventh (teacher interview, 2014).

From the observations that have been made by the researcher, biology teaching strategy employed by teachers are often lecture method. This method makes the teacher dominates the activity of learning in the classroom so that students become passive. Teachers be created as a the only one of information source so that learning activities and learning takes place in one direction only prioritizes affective aspects. To overcome this it is necessary to apply other strategy of learning, more actively engage students in the learning process.

Learning is a process of change that is not limited to performance skills. But it also includes functions, such as skill, perception, emotion, thought processes, resulting in improved performance (Trianto, 2009). Learning activity is a series of activities or the involvement of students in learning process that include asking question, answering teacher's question, giving opinion, doing homework/assignment, perform in front of class, and workteam. Learning strategy is a selected wisdom, which has been associated with factors that determine the color or the strategy, namely: (a). The selection of subject matter (teacher or student); (b). Presenters of subject matter (individual or group, or self-learning); (c). How to present the subject matter (inductive or deductive, analytical or synthesis, formal or non-formal); (d) Target recipients subject matter (group, individual, heterogeneous, or homogeneous). White and Gunstone (1992) have promoted the predict observe explain (POE) procedure as an efficient strategy for eliciting students' ideas and also promoting student discussion about their ideas. POE strategy is just applied to the experimental class. The POE strategy probes student understanding by requiring students to carry out three tasks. First, students must predict the outcome of some event or situation and must justify their prediction (P: Predict). Second, they describe what they

see happen (O: Observe). Finally, they must reconcile any discrepancy between prediction and observation (E: Explain) (Niaz et al, 2011).

METHODOLOGY

This research was held in SMA Negeri 15 Medan, which is located on Sekolah Pembangunan street No.7, District Sunggal Medan, Medan City. This research was conducted in April - June academic year 2013/2014.

The population in this research was all of grade eleventh students with the total six class of science program at SMA Negeri 15 Medan academic year 2013/2014 with totaling 230 students. The research sample of these research were two classes, 38 students from XI IPA 4 was treated with the POE strategy while 38 students from XI IPA 2 have taught with conventional method. The sampling taken from the total six class from grade XI science program. The researcher obtained the data from the teacher when observation about the students' learning outcomes to make sure the sample classes have the same learning outcomes by doing interview and teacher gave suggestion which the sample classes for this research that has nearly same learning outcomes belong to score of odd semester examination. Therefore, the sample of these research were two classes, 38 students from XI IPA 4 was treated with the POE strategy while 38 students from XI IPA 2 have taught with conventional method. In the treatment class, teacher provided pre-test to know students' initial capability at the first meeting and post-test at the last meeting, then the material will be delivered to students according the POE strategy. Although in the control class teacher also provided pre-test to know students' initial capability at the first meeting and post-test at the last meeting, then the material will be delivered to students according the lecturing strategy.

RESULT AND DISCUSSION

Scores Data for Pre Test. Pre test was given for students in grade XI science program SMA Negeri 15 Medan, there are three classes of students that given pre test, they are grade XI IPA II, III, and IV. The pre test result of those classes was calculated using t-test in order to select two classes as the object of this research. The classes that have no significant difference in pre test result were chosen XI IPA 2 as control class and XI IPA 4 as experimental class.

Pre test score of control and experimental class are 53.60 and 52.34. The pre test score as the data of students learning outcome was obtained after being given treatment with the lecturing strategy for both class. Statistical analysis indicates there is no significant difference in

pre test of students between experimental and control class. It indicates both class have the same level before give treatment.

Scores Data of Post Test. Post test score of experimental class and control class are 89.18 and 72.61. The post test score as the data of students learning outcome was obtained after being given treatment with different strategy. Experimental class was taught by POE strategy and control class was taught by lecturing strategy. Statistical analysis indicates there is significant difference in post test of students between experimental and control class. It indicates both class have the different level after give treatment.

Table 1. Result data of students' learning outcome

No	Data	Average of Scores	T _{count}	T _{table}	Conclusions
1	Pretest Experiment class	52.34	0.62	2.38	No differen significance
	Control class	53.60			
2	Postest Experiment class	89.18	8.76	2.38	There is significant difference
	Control class	72.61			

The result shows above concluded that learning outcome depends on how the learning process experienced by students, stated by Slameto (2010) and it is relevant with opinion Hamalik (2001) which stated efective learning is the learning that provide study opportunity by self or doing activity by self. This condition also relevant with the result of research conducted by Simarmata (2014) which found POE strategy affect student's learning outcome on cognitive aspect of students, and also it is relevant with the result of research conducted by Manurung (2011) where the students which taught by POE have reached KKM with average value from 70 in cyle I to 85 in cycle II.

Students' Activity. Student activity was observe for both experimental and control classes during research by helping of researcher friend and biology teacher of the school used observation sheet. Observation sheet which used to collect data of student activity contains six indicators, there are asking question, answering teacher's question, giving opinion, doing homework/assignment, perform in front of class, and workteam.

Table 2. Observation result for students' activity

No	Indicators	Students's activity (%)	
		Experimental class	Control class
1	Asking question	40.64	16.67
2	Answering teacher's question	81.58	53.80
3	Giving opinion	86.55	10.52
4	Doing homework/assignment	98.25	77.19
5	Perform in front of class	87.43	74.56
6	Work team	88.89	67.54
	Mean	80.56	50.05

The average of students' activity in experimental class is 80.56% that categorized as active and students' activity in control class is 50.05% that categorized as fair. It means that students' activity in experimental class is higher than students' activity in control class that was obtained for each indicator. This condition is relevant with the result of research conducted by Simarmata (2014) which found POE strategy affect student's activity. In her research, the student' contribution for all indicators is categorized as active about 60.55% with the highest percentage of student contribution in observing is categorized as very active.

In control class which taught using lecturing strategy, the contribution of students for all indicators is categorized as fair below 60% and the lowest percentage of students activity is the 3rd indicator namely giving opinion 10.52%. Students have less idea to share opinion becomes one factor which make that its indicator the percentage only reach the not active category. The second lowest percentage of students activity is the 1st indicator namely asking question about 16.67% because students have less curiosity in asking which make that its indicator the percentage only reach the not active category.

Statistical analysis for the average of student' activity for both classes is significantly different. It indicates the percentage of students' activity in learning human respiratory which taught using POE strategy is higher than student which taught using lecturing strategy on human respiratory topic in grade XI science program SMA Negeri 15 Medan academic year 2013/2014.

CONCLUSION AND RECOMMENDATION

Based on the result of research, it can be concluded as follow: 1) There is an effect of POE strategy on students' activity on human respiratory system sub topic in grade XI science program at SMA N 15 Medan academic year 2013/2014. The percentage of students' activity in experimental class that taught with POE strategy is higher than students in control class that taught with lecturing strategy, and 2) There is an effect of POE strategy on students' learning outcome on human respiratory system sub topic in grade XI science program at SMA N 15 Medan academic year 2013/2014. Learning outcome of students in experimental class that taught with POE strategy showed higher score than students in control class that taught with lecturing strategy.

It can be proposed some suggestion as follows: 1) For students, POE strategy can improve the activity and learning outcome of students caused its implemented in experimental or attractive lesson that able to interest and stimulate students to being involved in the learning process, 2) For biology teachers, POE strategy can be used as the appropriate learning strategy

for the effectiveness learning process. It can enhance teachers' awareness to develop their strategies in teaching as an alternative strategy for improving students learning outcomes and activity, and 3) To the researcher as prospective teacher in the next future, the result of this reasearch can be used as information source to increase information and knowledge about the benefit of implementing POE strategy in learning process.

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