

## The Linkages of Laboratory Facilities and Motivation to the Learning Outcomes of Semarang High School Students

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### Abstract

Biology as part of natural science is a collection of concepts-principles-theory (science product) where in there are a number of scientific values and properties. Therefore, biology learning must be carried out according to the method of work or scientific method in order to produce scientific products. Practicum activities carried out in learning are a scientific process that can make students do analytic thinking to understand science products. Motivation possessed by students in each learning activity is very instrumental in improving student. This study aims to determine the relationship between laboratory facilities and motivation for learning outcomes of high school students. This study has three variables: Variables (X1) is motivation, variables (X2) is laboratory facilities and variable (Y) is the student learning outcomes. this study was conducted using correlational quantitative method, the model used was the documentation method which aims to obtain data from student learning achievement, the data then analyzed using multiple regression analysis with the help of SPSS for windows release 20. The results of the study are as follow contribution of variables X1 and X2 (laboratory facilities and motivation) to variable Y (student learning outcomes) that is 59 % and the level of correlation is quite strong.

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## INTRODUCTION

Biology as part of natural science is a collection of concepts-principles-theory (science product), work system or scientific method, where in there is a number of scientific values and properties (Rustaman et al., 2012). Therefore, biology learning should be carried out according to work system or scientific method in order to produce science products.

Biology has specific characteristic, different from another sciences in case of its object, problem and method (Depdiknas, 2014). Biology study in Senior High School is developed through analytical thinking ability, inductive, and deductive to solve the problem that connected to surroundings natural phenomenon, therefore biology learning should be strengthened in process that is by strengthening scientific thinking so that the students can understand scientific product based on scientific process.

Practicum activity that carried out in learning is scientific processes that can make the students do analytical thinking to understand science product. Practicum activity is carried out to get learning goal appropriate with indicator that is stated in curriculum. If practicum activity is not carried out appropriate with curriculum, several learning goals will not be reached by students and this case can give impact to the learning result.

According to Supriyatna (2008), students are people who come to institution in order to reach or learn several education types. The students in their growing are categorized as adolescent in 16-18 years old. Adolescence is a period when differences between young people are increased both majority, that aimed to fill in adulthood and make a productive person, and minority (one of five) that will face the big problem. (Papalia et al., 2008).

Senior High School students get the demand and duty of development to finish their education level. The completion of students' education level is officially written in a daily learning achievement, UTS and UAS that has a role as measure of student ability. Therefore

great motivation is needed in order that the students SMA can complete assignments in their education level.

Learning motivation contains existence of student goal or aspiration. Students should have motivation in order to understand what the learning goal is. Besides that the good condition of students in learning will cause the student to be enthusiastic in learning and able to complete the task well. The opposite is the student who is sick; he has no passion in learning (Dimiyati & Mudjiono, 2013). Students learning motivation can be weak, this lack of motivation will give impact the weakness in activities, so that the quality of learning outcomes becomes low. Therefore, learning motivation for students needs to be strengthened continuously. With the aim that students have strong learning motivation, so that the learning outcomes achieved by them will be optimal.

Learning motivation possessed by students in each learning activity is very instrumental in improving student learning outcomes in certain subjects (Yan, 2010). These students will understand what is learned and mastered and remembered for a long time. Students appreciate what they have learned so that they feel their usefulness in daily life in society.

Students who are highly motivated in learning enable them to obtain higher learning outcomes as well. It means that the higher the motivation, the higher the intensity of the effort done, the higher the learning outcomes obtained. Students make an effort to increase success in learning in order to achieve satisfying success as expected. In addition, motivation also sustains efforts and keeps learning process going on. This makes students persistent in learning. If learning motivation arises every time, it is probable that learning outcomes increase (Wang, 2009).

Based on the results of research conducted by Juhairiyah (2012), available laboratory facilities affect the level of student achievement. The level of students achievement in learning outcome is the level of achievement obtained by students while in school. The high or low

learning outcomes can indicate the level of students success in going through academic process. Learning outcomes are still a standard for student competence. The importance of learning process greatly affects the learning outcomes that will be achieved.

Observation results show that the achievement of learning outcomes in school of biology students in Semarang should not be separated from the use of available laboratories and motivation built both externally and internally in students, but it appears that the use of laboratories is still not optimal in accordance with learning plan that has been designed by the teacher, and student motivation is seen only to fulfill learning interests, so that further research is needed that influences school learning outcomes has achieved is good grades.

Based on this background, it is necessary to analyze the relevance of laboratory facilities and motivation to the learning outcomes of student of Senior High School Semarang.

## METHODS

This research uses multiple correlational quantitative method (Creswell, 2009). Design on this research is multiple correlations with two independent variables and one dependent variable. The independent variable in this study is supporting facilities of biology learning and students motivation in learning. The dependent variable in this study is student learning outcomes. Correlation coefficients that are later produced indicate the level or degree of relationship between biological laboratory facilities and learning motivation with the learning outcomes of Senior high school students in Semarang.

The selection of schools was taken by purposive sampling, namely schools that had adequate laboratory facilities. Adequate schools were fulfilled requirements with total number 5 state schools and 13 private schools. However, researchers chose school samples randomly. The school numbered 3 schools namely one from private Senior high school and two from public

Senior high school. The schools are SMA Semesta, SMA 3, and SMA 5 Semarang.

Population of research was all students of class XI Science. Student sample was selected by using cluster random sampling for class XI at SMA Semesta totaled 63 students, SMA 3 totaled 37 students and SMA Semarang totaled 32 students. The number of sampling was 132 students. Data analysis method uses validity test, reliability test, normality, homogeneity, linearity, multicollinearity, and multiple correlation analysis tests.

## RESULTS AND DISCUSSION

The research results obtained by the researcher are described for each variable. The discussion of variables is carried out using quantitative data, namely the data processed in a form of numbers which are then interpreted descriptively. The variable data described in this study are laboratory facilities and student learning motivation (variable X) with student learning outcomes (variable Y).

### **The research result of Laboratory Facility Correlation (X1) Towards Learning Outcomes (Y)**

It was showed in Table 1, laboratory facilities have an effect 32%, and the effective contribution in learning is 56% in this study. A positive relationship between facilities and student learning outcomes can be seen from the test result that students got. Good facilities in these laboratories can help the students do observation directly, in addition that students can understand better without just imagining.

However, facilities in a good laboratory do not fully show significant results appropriate with the results that appear to contribute only 32%. In the laboratory one of them is related to the availability of tools and materials in the laboratory. With good facilities, the equipment for practicum should also be good. However, it turns out that with good equipment conditions, the skill to use tools and materials for students is still in the lower category compared to the availability of the ingredients. This is partly due

to the lack of optimum use of the equipment even though the tools available in the laboratory are quite complete.

This study was supported by research conducted by Susanti (2012) about the effect of using learning facilities in schools and learning interest on learning outcomes, concluded that an influence on the use of learning facilities in schools and learning interest towards learning outcomes of integrated natural science for Grade IX at SMPN 8 Bandar Lampung in academic

year 2011/2012 as evidenced by the test result  $F_{count} > F_{table}$  is  $87.804 > 3.079$ .

The research conducted by Elyanti (2013) showed that facilities partially affected learning outcomes of IPA in junior high school in Pasir Penyu district. This is indicated by the t test obtained by the value of  $t_{count} > t_{table}$  ( $3.130 > 1.977$ ), so that  $H_0$  is rejected. The value of t count is positive, meaning that the facilities increased, the learning outcomes increased.

**Table 1.** correlation of facilities, motivation, and learning outcomes

	R	R Square	Sig.F Change
Laboratory facilities(X1) and learning outcomes(Y)	.566 <sup>a</sup>	.320	.000
Students motivation(X2) and learning outcomes (Y)	.720 <sup>a</sup>	.518	.000
Laboratory facilities(X1), students motivation(X2) towards learning outcomes (Y)	.768 <sup>a</sup>	.590	.000

**The results of the study of Correlation of Learning Motivation (X2) Against Learning Outcomes (Y)**

The contribution of variable student learning motivation (X2) towards students' learning outcomes of Senior high school Semarang (Y) is 51.5%, while the effective contribution (SE) variable learning motivation (X2) towards students' learning outcomes of Senior high school Semarang is 72%

Seen in Table 1, the correlation coefficient obtained from the results of student motivation towards learning outcomes is 0.720. Because this value is higher than r table, then  $H_a$  was accepted that there is a significant relationship of student learning motivation towards student learning outcomes. Furthermore, according to the data processing result above, motivation has

a contribution of 51.5% to determine student learning outcomes.

This study is in line with research conducted by Abdulrahman (2014). The results of the analysis revealed that learning motivation contributed 48.3% in the results of Islamic Education learning achievement. The contribution of learning motivation is quite high in influencing the learning achievement of Islamic Religious Education. It means that learning motivation has an important position so students should have high learning motivation to be able to achieve learning achievement in Islamic Religious Education subjects.

Motivation is an effort that is based on mobilizing and maintaining one's behavior so that he is motivated to act to do something in order to achieve certain results or goals.

Learning motivation is a change in energy in a person that is characterized by the emergence of feelings and reactions to achieve goals (Moore. 2012).

Motivation is an effort to increase or hold a movement to achieve certain goals. In addition, a similar study was conducted by Novianti (2011) that motivation in student learning has a positive effect in improving student learning outcomes in school. Learning motivation is an internal and external impulse that causes a person or individual to act or achieve goals, so that changes in behavior in students are expected to occur (Michele, 2017).

### **Research Results of Facilities Correlation (X1) and Motivation (x2) towards Students Learning Outcomes (y)**

Correlation of two independent variable both laboratory facilities and learning motivation towards learning outcomes, based on Table 1, known that the correlation between laboratory facilities and learning motivation towards students learning outcomes, the correlation coefficient is 0,768, this results showed that there is high effect. While the effective of both variables is 76,8% meaning that still another factors that can affect students learning outcomes that was not studied by the researcher.

Nurubaya (2014) in her study about the effect of education facilities utility towards student learning motivation in SMP Dua Ciputat, showed that facilities utility contributed to students learning motivation. Research results showed that there is significant effect between learning facilities in school and students learning motivation.

Research by Watono (2015) showed that there is positive and significant correlation between learning facilities utility and students learning motivation towards the increase of learning achievement value with correlation coefficient is 0,470 and determination coefficient 0,165 or 16,5% students learning achievement because of good utility of learning facilities.

Research conducted by Irmawati (2013) also in line with study conducted by researcher,

that there is learning motivation effect, and learning facilities utility in school towards learning outcomes IPA students grade VIII SMP Kartikatama Metro in academic year 2012/2013 evidenced by test result  $f_{count} > f_{table}$  is  $38,527 > 3,93$ .

Research conducted by Elyanti (2013), about facilities and students motivation effected learning outcomes in SMPN in Pasir Penyu district. It was showed by F test of value  $F_{count} > F_{table}$  (49,567.3,059).

These studies in line with assumption and passion of researcher, in this thesis mentioned that facilities and motivation has positif effect towards students learning outcomes. It means that the good facilities, the good motivation, the good effect of learning outcomes.

### **CONCLUSION**

Based on data analysis results, research results interpretation and discussion, concluded that there is significant positive correlation between laboratory facilities and students motivation towards students learning outcome grade XI SMA in semarang. Correlation coefficient is 0,768 bigger than  $r_{table}$  0,44. Contribution of variable X1 and X2 (laboratory facilities and students motivation) towards variable Y (students learning outcomes) is 59% and this correlation level is in quite strong category.

Based on this research results, suggested that students learning achievement should be increased by the increase of variation of learning motivation and the increase of quality and quantity of laboratory facilities.

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