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Relationship among Self-Motivation, Self-Efficacy and Achievement of High School Student in Biology

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Abstract. This research aims to reveal: (1) the relationship among self-motivation and self-efficacy of high school student in biology (2) the relationship among self-efficacy and achievement of high school student in biology (3) the relationship among self-motivation and self-efficacy of high school student in biology, and (4) the relationship among self-motivation and self-efficacy and achievement of high school student in biology. This research was a quantitative descriptive research, using a survey method. The instrument used a questionnaire for collecting the data. The population was all of grade XI students of natural science class of high schools in Yogyakarta City. The sample was by using the quota sampling technique. The data were analyzed by using the linear regression, Pearson correlation coefficient, and multiple regression analysis. The criteria for determination was at the significance level of 0.05.

Keywords: Achievement; Biology; Self-efficacy; Self-motivation.

1. Introduction

The biology learning process is mainly an interaction between students and the objects of biology in the learning environment to achieve the learning goals. Therefore, the main activity in learning biology is doing exploration and experiment on living things. Students do inquiry process concerning where, when, who, and how organisms live. Students work cooperatively to do the exploration and experimentation. In the learning process there are interactions between students teachers and students and among the students. The teacher guides their learning. The students can share their knowledge and understanding and doing scientific process skills together as a learning community [1], [2].

Based on the publication of the International Association for the Evaluation of Educational Achievement (IEA) that are associated with the achievement of TIMSS in 2011 found that Indonesia ranks at 40 out of 45 participating countries with an average achievement of 406, this shows that the average achievement in Indonesia is smaller than those of the average of achievement world wide. Subjects of biology is included in the subjects cluster of science. Based on the research conducted by Trends In Mathematics and Science Study (TIMSS) in 2011, it can be seen that the ability of competence, skills and Indonesian student achievement in science is weak [3]. In line with the research by Çimer in [4] which states that the main reason for the difficulty of learning biology is the nature of the material that is hard, the teacher's teaching style, student learning and study habits, negative attitudes of students towards the material and lack of resources. With this statement, the students learning style and study habits can be determined, negative attitudes of students on material



associated with self-motivation and self-efficacy of students also can be seen.

In fact, some things show whether students in general still have motivation in learning, which involves intrinsic motivation. The symptoms indicated the reduced students' attention during lessons, homework assignment negligence, delay in preparation for the quiz or exam until the last moment, have a view that they "pass the exam, obtain average score" and so forth. In general, it can be found that students who already have a goal in achieving biology learning are as if to have an ideal related to biology, the ideals that require one to understand biology, and the ideals associated with mastering biology. These conditions make the students are confident about the future, and know what to do so that goal is reached, instead found that students with the goal of inferiority, unsure about their future and do not know what will be done only follow what is going to happen. Theoretically, the students who have high self-motivation has the goal to be achieved so that the self-efficacy or confidence high will try to make to reach that goal. Unlike the students who have low self-motivation and self-efficacy, they do not have confidence to have and even achieve its objectives. Self-motivation refers to being results oriented and pursuing goals beyond what is required. Highly self-motivated people set challenging goals for themselves and others; seek ways to improve their performance; and readily make personal sacrifices to meet the organization's goals. They harness their emotions and employ them to improve their chances of being successful in whatever they are seeking to accomplish. They operate from hope of success rather than fear of failure [5]. Alwisol in [6] stated that self-efficacy is self-assessment in doing good or bad, right or wrong, can or cannot be as needed. Hence, self-efficacy is related to the belief that the self has the ability to perform the expected action.

Based on the above discussion, the questions arise from this study can be described as follows:

- a. Is there any relationship among self-motivation and achievement of high school student in biology?
- b. Is there any relationship among self-efficacy and achievement of high school student in biology?
- c. In there any relationship among self-motivation and self-efficacy of high school student in biology?
- d. In there any relationship among self-motivation and self-efficacy and achievement of high school student in biology?

The rest of this paper is organized as follow: Section 2 describes the proposed research method. Section 3 presents the obtained results and following by discussion. Finally, Section 4 concludes this work.

2. Research Method

This study was descriptive quantitative research by using cor-relational research design. This design was used to examine the relationship between self-motivation and self-efficacy on academic achievement. The method applied was a survey method, a research which taking sample from a population and applying questionnaires and documentation as an instrument of data collection technique. The population in this study were all students of grade XI IPA of State High School in Yogyakarta, consisted of 11 schools. Ary in [7] According to Donald recommended sample size ranged from 10% to 20% of the population reachable. Due to the total population which is big, then conducted sampling of schools to be used. The schools were grouped in three categories namely high, medium and low. These categories are based on the average score of the National Examination of Biology in the academic year of 2015/2016. The sample taken to represent the data was 20% of the 11 schools taken for the sample of this study. The sample size of the school was $20\% \times 11 = 2.2$ calculated as 2 schools. The sampling of students was conducted by quota or the quota sampling technique. The calculation of the sample used was by using the formula of $20\% \times 1147 = 230$ students. The specific form of questionnaire includes completing the identity and ideals such as stuffing, filling the gender in the form of check list, and completing a statement in the form of rating scale or a multilevel scale that was equipped with a column that shows the scale of four levels of scale. The statement was made in the form of favorable sentence in the form of a positive and supportive or siding against self-motivation and unfavorable form negative sentences and are not supportive of self-motivation [8]. The questionnaire to measure the student's self-efficacy on the academic achievement

of biology, includes a statement by using a measurement scale proposed by Badura in [9]. Self-efficacy scale was by using an interval of 0-100. The scale was made to be more sensitive and more reliable [9]. The score of 0 means that there is no certainty in mastering the subject, 50 means confident enough in mastering the subject, 100 means strongly confident in mastering the subject. Scoring used a score of 0 to 100 for each item statement filed suit the chosen alternative answers. The closer to 100. then indicated respondents to have a high degree of confidence. The closer to 0, then indicates that respondents to have a low confidence level.

0 10 20 30 40 50 60 70 80 90 100
 Cannot Moderately Highly certain
 do at all certain can do can do

3. Result and Discussion

Correlation descriptive data among self-motivation and self-efficacy and achievement of high school student in biology (see Table 1).

Table 1. Descriptive Data Correlation Self-Motivation, Self-efficacy and achievement of High School Student in Biology

No.	Description	Self-motivation	Self-efficacy	achievement
1.	Amount of data	230	230	230
2.	Minimum	79	490	52
3.	Maximum	136	2000	91
4.	Average	101.9	1442	80.1
5.	Variance	71.67	72970.04	29.01
6.	Standard Deviation	8.4	270.13	5.38

The data provides an overview of the amount of data collected, minimum scores from self-motivation, self-efficacy and achievement, maximum scores from self-motivation and self-efficacy and achievement, average from self-motivation and self-efficacy and motivation, average scores resulting from self-motivation and self-efficacy and achievement, variance from self-motivation, self-efficacy and achievement, standard deviation from self-motivation, self-efficacy and achievement. Based on the analysis of the study, then the discussion of the results of the study can be described as follows.

3.1. Relationship Among Self-Motivation and Achievement of High School Student in Biology

The Results of correlation coefficient analysis/ relationship (R) among the self-motivation and achievement obtained at 0.225. This value gives the sense that there is low relationship between self-motivation and achievement of high school student in biology. And then the linear regression testing provided results that there is a positive relationship between self-motivation and achievement of high school student in biology indicated by the significant level criteria determined by the significant value of test (sig) of 0.001 which means that the value of sig < the significance criteria of 0.05. According to the theory of Winkel [10] principally, self-motivation is a better motivation since there is an essential relationship between needs met and learning activities, so that this form of motivation tend to be last longer, generate interest and accompanied by pleasure feelings. When students was still study in elementary school, the form of extrinsic motivation is still dominant but on the contrary, the students who had reached high school, the self-motivation has become dominant since at this stage of development, the students are able to realize the importance of learning for their own development. Intrinsic motivation is also influenced by extrinsic motivation, where extrinsic motivation can change to intrinsic motivation. If motivation has become intrinsic, then people have become highly motivated so that there are no challenges that will hinder him from doing that.

3.2. Relationship Among Self-efficacy and Achievement of High School Student in Biology

The results of correlation coefficient analysis/ relationship (R) among self-efficacy and achievement obtained a value of 0.302. This value gives interpretation that there is low relationship between self-efficacy and achievement of high school student in biology. Based on the result of linear regression testing, it can be seen that there is a positive relationship between self-efficacy and achievement of high school student in biology by using the significant level criteria determined by the significant value of test (sig) of 0.000 which means that $<$ the significance criteria of 0.05. The case study conducted by Vicoriana stated that a person who has high self-efficacy and high confidence will be able to perform the learning activities task, will have confident in academic achievement, confident to show scientific attitudes, confident to be able to utilize social resources [2]. Theory of Omrod, people with high self-efficacy tend to do a lot of learning and obtain great achievement than those who have low self-efficacy since some individuals have the same ability, those who believe they can do a task are more likely to complete the task successfully than those who are not sure of being able to achieve success [11].

3.3. Relationship Among Self-Motivation and Self-efficacy of High School Student in Biology.

The results of correlation coefficient analysis/ relationship (R) among self-motivation and self-efficacy obtained a value of 0.389. This value gives interpretation that there is low relationship between self-motivation and self-efficacy of high school student in biology. And then The simple correlation testing obtained result that there is a significant relationship between self-motivation and self-efficacy of students grade XI SMA Negeri Yogyakarta. This result is indicated by the significant values of self-motivation and self-efficacy of 0.000 $<$ 0.05. A person who has high confidence (self-efficacy) of his/her ability will assume a problem as a challenge that must be taken and not as a threat. This orientation can maintain their self-motivation. On the contrary, individual who has no confidence (self-efficacy) or doubt his/her ability will be difficult to motivate himself/ herself and easy to give up in dealing with a problem. In accordance to the theory of Elliot stated that self-efficacy has an interaction with motivation [12]. In addition, Shuck stated that students who previously obtained difficulty but are confident to succeed can override the negative effects of previous difficulties which then resulting in motivated behavior [13].

3.4. Relationship among Self-Motivation and Self-efficacy and Achievement of High School Student in Biology

The multiple regression testing obtained result that among self-motivation and self-efficacy have relationship with achievement of high school student in biology indicated by the results of the analysis which showed that the significant value of 0.000 less than the significance level of 0.05. The results of correlation coefficient analysis among self-motivation and self-efficacy to achievement obtained a value of 0.324. This value gives interpretation that there is low relationship between self-motivation and self-efficacy and achievement of high school student of biology. Myres stated that people who believe in their own competence and effectiveness, as well as having an internal control center, perform better handling and achieve more than others [14]. In accordance to the theory of Pintrich in [15] which stated that self-efficacy and positive intrinsic value associated with the involvement and cognitive performance. Intrinsic value does not have a direct influence on the performance but strongly associated with self-regulation and the use of cognitive strategies, regardless of previous achievement. Research by Harahsheh in [16] showed the high levels of self-efficacy and achievement motivation among students. Vancouver & Kendall stated that self-efficacy tends to have a positive role in the motivation that will ultimately affect the performance of an individual [17]. Jungert in [18] stated that the student's character refers to intrinsic motivation, external regulation and self-efficacy which are interrelated to each other.

4. Conclusion

Based on the results, it can be drawn conclusions as follows: (1) There is a low relationship among self-motivation and achievement of high school student in biology; (2) There is a low correlation among self-efficacy and achievement of high school student in biology; (3) There is a low correlation among self-motivation and self-efficacy of high school student in biology; (4) There is a low low relationship between self-motivation and self-efficacy and achievement of high school student of biology.

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