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Are self-confidence and curiosity in studying biology related to achievement motivation?

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Abstract

In the 2013 curriculum students are required to be active in all learning activities. Through active learning that has been applied, students are expected to be able to explore deeper information about Biology material that has or has not been explained by the teacher. This attitude shows that students have curiosity which will then lead to self-confidence so that it encourages students to achieve good results. This study aims to determine the correlation between self-confidence in studying biology and curiosity (curiosity) with student achievement motivation. This research was conducted at SMAN 97 Jakarta in the even semester 2020/2021 academic year. The method used is a quantitative method through correlational studies. The sample used was 100 students taken from three classes of XI MIPA using simple random sampling technique. The data in this study were taken using three test instruments, namely: self-confidence test, curiosity test and student achievement motivation test. Most of the results obtained from the three tests are in the high category, with the percentage of confidence in studying biology by 62%, curiosity by 62% and student achievement motivation by 57%. Therefore, based on the results of the study, it was found that there was a positive correlation between self-confidence in studying biology and curiosity with student achievement motivation.

Abstrak

Pada kurikulum 2013 siswa dituntut aktif dalam segala kegiatan pembelajaran. Melalui pembelajaran aktif yang sudah diterapkan, siswa diharapkan dapat mengeksplor informasi yang lebih dalam tentang materi Biologi yang telah ataupun belum dijelaskan oleh guru. Sikap tersebut menunjukkan bahwa siswa memiliki rasa ingin tahu yang kemudian akan memunculkan rasa percaya diri sehingga mendorong siswa untuk mencapai hasil yang baik. Penelitian ini bertujuan untuk mengetahui hubungan antara kepercayaan diri dalam mempelajari biologi dan rasa ingin tahu dengan motivasi berprestasi siswa. Penelitian ini dilaksanakan di SMAN 97 Jakarta pada tahun ajaran 2020/2021 semester genap. Metode yang digunakan adalah metode kuantitatif melalui studi korelasional. Sampel yang digunakan berjumlah 100 siswa yang diambil dari tiga kelas XI MIPA dengan menggunakan teknik *simple random sampling*. Data dalam penelitian ini diambil dengan menggunakan tiga instrumen tes, yaitu: tes kepercayaan diri, tes rasa ingin tahu dan tes motivasi berprestasi siswa. Hasil terbanyak yang diperoleh dari ketiga tes tersebut masuk dalam kategori tinggi, dengan presentase kepercayaan diri dalam mempelajari biologi sebesar 62%, rasa ingin tahu sebesar 62% dan motivasi berprestasi siswa sebesar 57%. Oleh karena itu, berdasarkan hasil penelitian diperoleh bahwa terdapat hubungan positif antara kepercayaan diri dalam mempelajari biologi dan rasa ingin tahu dengan motivasi berprestasi siswa.

A. Introduction

The current learning process refers to curriculum 2 013, where the learning process is applied using active learning (active learning). Students with a high interest in learning will actively participate in learning activities, which will automatically have an impact on the quantity and quality of the questions and statements they share (Davies et al., 2013). More than that, active learning allows students to develop higher-order thinking skills, such as analyzing, synthesizing, and evaluating various learning events and applying them in everyday life (Rusman, 2011).

Active students have the following characteristics: (1) there is physical, mental, emotional, intellectual, and personal involvement in the learning process, (2) there are various activities of students knowing, understanding, analyzing, doing, deciding, and various activities. other learning activities that contain a fairly high element of independence, (3) active involvement in creating a harmonious, harmonious and balanced learning atmosphere in the learning and learning process, (4) student involvement in proposing initiatives, providing answers to teacher questions, asking questions or problems and try to answer them themselves, assess answers from colleagues, and solve problems that arise during the teaching and learning process (Hamalik, 2015).

Active learning has begun to be applied to all subjects, one of which is Biology. But in reality, there are still many problems that appear in the active learning process. Students who are expected to be active during learning are more silent, are reluctant to ask questions or have opinions, and do not want to explore the material that has been given, one of which is biology material. The behavior of these students shows that students lack or do not have self-confidence.

Lauster (2012) explains that self-confidence is an attitude or feeling of confidence in one's abilities so that the person concerned is not too anxious in his actions, can feel free to do what he likes and is responsible for his actions, warm and polite in interacting with people and have the drive to excel. Lack of confidence will make students tend to run away from the problems at hand. It is indirectly influenced by the biological processes that occur in the body system. When individuals feel stressed when they face something they perceive as pressure, threat, or danger, the body will respond by releasing the hormone adrenaline. Adrenaline hormones work together with cortisol and noradrenaline hormones in regulating the body's reaction to stress (Bancos, 2022).

In addition to confidence in learning biology, students' curiosity also has the potential to improve learning (Pluck & Johnson, 2011). Students with high curiosity have a broad scope of exploration so that the information sought or obtained will be much more. Curiosity is a natural emotion that exists in humans where there is a desire to investigate and find out more about something they are learning (Silmi & Kusmarni, 2017).

Curiosity can be seen from several things including: (1) acting in a certain way to find out, the usual actions of someone who displays curiosity can be in the form of looking at an object or something deeper, touching it, or providing additional actions with the hope of can know more; (2) asking several questions to other people, the questions asked are questions that are felt to refer to something they want to know, and are asked to people who feel they know better; (3) reading a book, the book that is read is, of course, a book that leads to something you want to know, to better understand the object or something; (4) experimenting, it can be a simple experiment, the result of asking questions or a book source, it can also be from one's thoughts (Engel, 2015). From the attitude of curiosity that arises in students, it is hoped that students are also motivated during the learning process.

Strongly motivated students have a lot of energy to carry out learning activities. The student will show interest, concern, and enthusiasm in carrying out learning activities, trying to succeed, pursuing tasks, and using effective learning strategies (Schunk et al., 2012). Motivation is the basic drive that moves someone to behave (Uno, 2012). Motivation has an important role in the learning process to get better academic results (Christiana, 2009; Awan et al., 2011; Singh, 2011). The results of other studies on learning motivation proposed by several researchers also state that student learning motivation is an important variable that affects the success of achieving learning goals (Supriyatin et al., 2017; Azrai et al., 2016).

Not only learning motivation, one of the indicators that are equally important during the learning process is achievement. Achievement is a real ability that is the result of the interaction between various factors that influence both within and from outside the individual in learning (Sardiman, 2018). The acquisition of learning achievement cannot be separated from motivation (Djamarah, 2010). Achievement motivation is an individual's effort and belief to realize learning

goals with certain standards of success and being able to overcome all obstacles that hinder the achievement of goals (Atmoko & Hidayah, 2014). Furthermore, the definition of achievement motivation can also be said as a motivation that aims to pursue achievement, namely to develop or demonstrate high abilities (Purwanto, 2014).

The purpose of this study was to determine the correlation between self-confidence in studying biology and curiosity with students' achievement motivation. Based on the problems and previous research, further research is needed on the correlation between self-confidence in studying biology and curiosity with students' achievement motivation.

B. Method

This research was conducted at SMA Negeri 97 Jakarta, in the even semester of the 2020/2021 academic year. A total of 100 students were taken randomly from classes XI MIPA 1, XI MIPA 2, and XI MIPA 3 with a total of 108 students at SMA Negeri 97 Jakarta.

Data collection techniques were carried out using a self-confidence test, a curiosity test (a curiosity test), and an achievement motivation test for students. The instrument uses 5 answer options, namely: strongly agree, agree, hesitate, disagree, and strongly disagree. Giving a score if the statement is positive then the assessment is 5, 4, 3, 2, 1 with alternative answers used: strongly agree, agree, hesitate, disagree, and strongly disagree. As for negative statements, the assessment is 1, 2, 3, 4, 5 with alternative answers used: strongly disagree, disagree, hesitate, agree, and strongly agree.

The data obtained from the research instrument will be analyzed through several stages: (1) Prerequisite test by conducting normality test and homogeneity test, and (2) Hypothesis testing by performing simple linear regression test, simple correlation test, multiple regression test, and correlation test. double. All tests will be carried out using SPSS 25.0 software. To see the strength of the correlation between variables, the following criteria for the strength of the correlation are used:

Table 1. Criteria for Correlation Strength

Coefficient Interval	Correlation Level
0,80 – 1,00	Very Strong
0,60 – 0,79	Strong
0,40 – 0,69	Strong Enough
0,20 – 0,49	Low
0,00 – 0,19	Very Low

(Riduwan, 2014)

Then, the data obtained will be added up for each of the variables and students. To determine the criteria for students to be in the very high, high, medium, low, and very low categories, the categorization norms are used as follows:

Table 2 Categorization Norms

Category	Value Range
Very High	$\mu + 1{,}5\sigma < X$
High	$\mu + 0{,}5\sigma < X \leq \mu + 1{,}5\sigma$
Currently	$\mu - 0{,}5\sigma < X \leq \mu + 0{,}5\sigma$
Low	$\mu - 1{,}5\sigma < X \leq \mu - 0{,}5\sigma$
Very Low	$X \leq \mu - 1{,}5\sigma$

(Azwar, 2012)

C. Results and Discussion

First, the prerequisite test was carried out, namely the normality test and homogeneity test. The normality test was performed using the Kolmogorov-Smirnov test at = 0.05. Based on the calculation of the score of self-confidence in studying biology, curiosity and achievement motivation of students obtained a significance value (p) = 0.200. This shows that the significance value (p) > 0.05 is 0.200 > 0.05, which means H0 is accepted.

From the calculations obtained, it can be concluded that the data on self-confidence in studying biology, curiosity, and achievement motivation of students are normally distributed. Furthermore, the homogeneity test was carried out using the Bartlett test at = 0.05. Based on the calculation of the homogeneity of the self-confidence scores in studying biology, curiosity, and achievement motivation of students, a significance value (p) = 0.000 was obtained. This shows that the significance value (p) < 0.05 is 0.000 <0.05, which means that H0 is accepted. So it can be concluded that the variants of self-confidence in studying biology, curiosity, and student achievement motivation are the same or homogeneous.

Second, test the hypothesis. In this study, three times hypothesis testing using the SPSS 25.0 program at = 0.05. The hypothesis testing includes : (1) The correlation between self-confidence in studying biology and student achievement motivation; (2) The correlation between curiosity and student achievement motivation; and (3) The correlation between self-confidence in studying biology and curiosity with students' achievement motivation.

Table 3 Normality Test Results

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		100
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	7.19849520
Most Extreme Differences	Absolute	.058
	Positive	.042
	Negative	-.058
Test Statistic		.058
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This a lower bound of the true significance.

Table 4 Homogenity Test Results

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.739
Bartlett's Test of Sphericity	Approx. Chi-Square	209.700
	Df	3
	Sig.	.000

1. The correlation between self-confidence in studying biology and student achievement motivation

Based on the test results of the simple linear regression model, a significance value (p) of 0.000 was obtained and was declared significant. The calculation of a simple linear regression model produces the equation = 27.212 + 0.788X1 for self-confidence in studying biology (X1) and achievement motivation (Y) (Figure 1). Then, the results of the linearity test resulted in a data significance level (p) (0.088) > (0.05) which means that there is a linear correlation between the two variables. Furthermore, testing the correlation coefficient, obtained the results of the correlation coefficient (rx1y) of 0.723 which means the correlation with the criteria is high. The result of the coefficient of determination is 52.3%.

2. The correlation between curiosity and student achievement motivation

Based on the test results of the simple linear regression model, a significance value (p) of 0.000 is obtained and it can be concluded that the regression model is significant. The calculation of the simple linear regression model produces the equation = 8.883 + 0.866X2 for curiosity (X2) and achievement motivation (Y) (Figure 2). Then, the results of the linearity test resulted in a data significance level (p) (0.316) > (0.05) which means that there is a linear correlation between the two variables. Furthermore, testing the correlation coefficient, obtained the results of the correlation coefficient (rx2y) of 0.820 which means the correlation with the criteria is very high. The result of the coefficient of determination is 67.2%.

3. The correlation between self-confidence in studying biology and curiosity with student achievement motivation

Based on the results of the multiple linear model test, a significance value (p) of 0.000 was obtained and it can be concluded that the regression model is significant. The calculation of the multiple regression model produces the equation = 5.019 + 0.211X1 + 0.703X2 for self-confidence in studying biology (X1), curiosity (X2) and achievement motivation (Y). Based on the results of calculations using the SPSS 25.0 program, a significance value (p) < is 0.000 < 0.05, so it can be concluded that there is a positive correlation between self-confidence in studying biology and curiosity and student achievement motivation. The results of the correlation coefficient (rx1x2y) obtained are 0.828, which means the correlation with the criteria is very high. The result of the coefficient of determination is 68.5%.

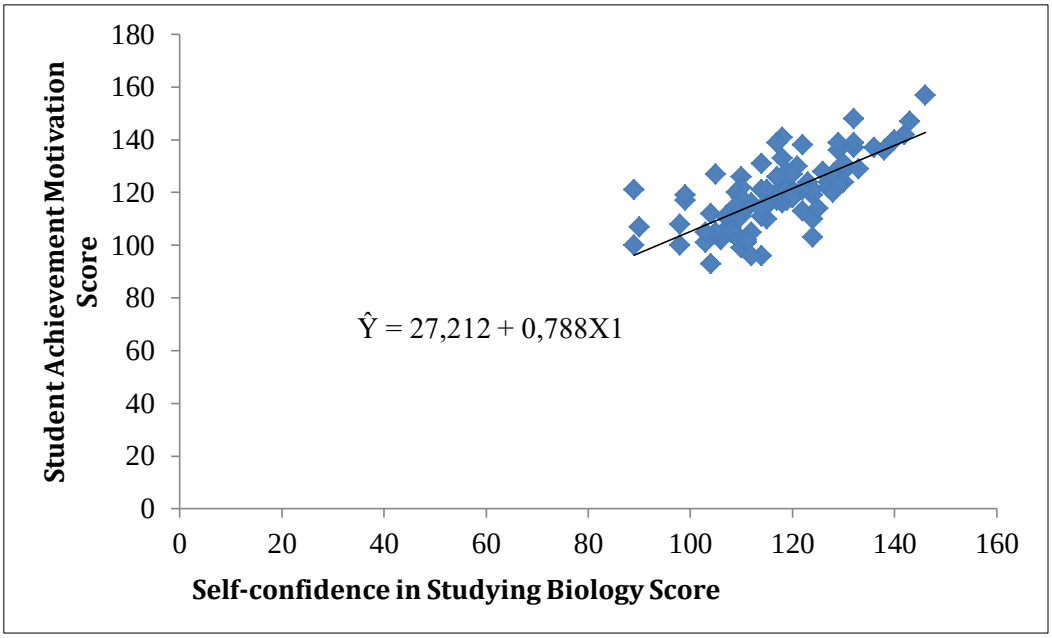

Figure 1
Simple Linear Regression Model Confidence Score in Learning Biology with Student Achievement Motivation Score

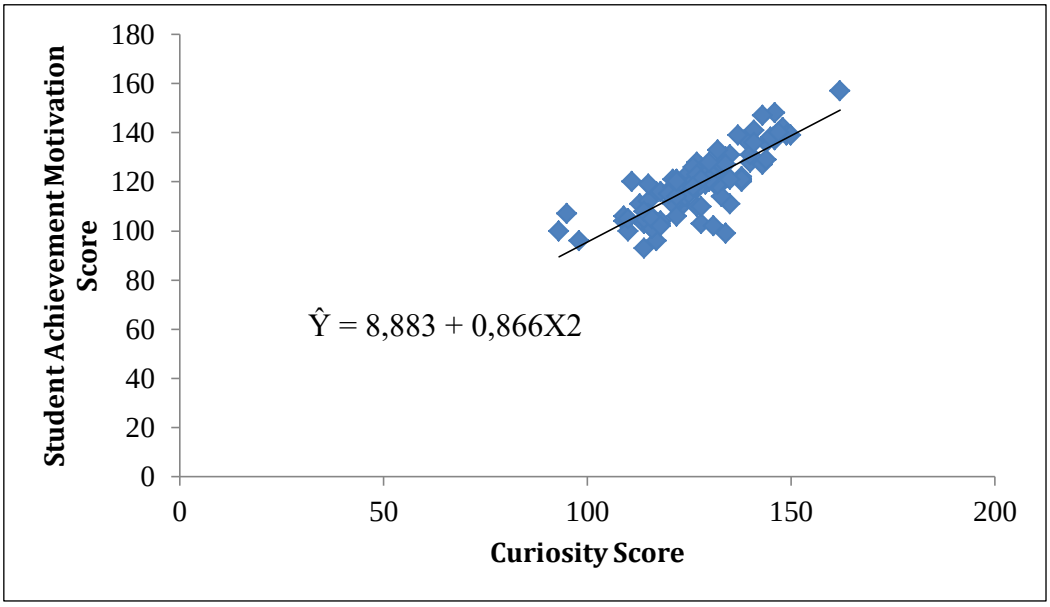

Figure 2
Simple Linear Regression Model Curiosity Score with Student Achievement Motivation Score

Based on the results of the study using the multiple correlation test, the results showed that there was a positive correlation between self-confidence in studying biology and curiosity and student achievement motivation. The results of testing the first hypothesis show that there is a high correlation between self-confidence in studying biology and student achievement motivation. This is because students' self-confidence is one part that affects student achievement motivation. With the existing self-confidence, students will be encouraged to ask, answer, explore, criticize or express the information obtained boldly.

Various incentives that lead to student progress or success can be referred to as achievement motivation. This is reinforced by the results of research by Yulistiana (2014) which states that an individual with a high level of achievement motivation also tends to have a high level of self-confidence. Furthermore, it is said that someone with high achievement motivation has self-confidence that functions well in situations where they take personal responsibility and can

control what happens to them (Bajaj & Ahmed, 2021).

Next, the results of testing the second hypothesis show that there is a very high correlation between curiosity and student achievement motivation. The attitude of curiosity that students have will be very helpful in the learning process. Students with high curiosity have a broad scope of exploration so that the information sought or obtained will be much more. This is reinforced by the results of Utami & Subali's (2020) research which states that the higher student's curiosity, the more information is obtained. Curiosity can provide encouragement and support so it is very necessary for learning (Philips, 2014). Furthermore, Jirout & Zumbrunn (2018) said that achievement motivation is one of the important factors that influence curiosity. Students who have achievement motivation will look more enthusiastic and focused when learning takes place.

Furthermore, based on the results of testing the third hypothesis, it proves that self-confidence in studying biology and curiosity together has a very high correlation with students' achievement motivation. This is because self-confidence is a component that influences achievement motivation in students, where self-confidence raises the courage to show students' potential and talents.

Confidence in studying biology can be increased by high curiosity, this is because students with high curiosity will seek, give or discuss more biological material so that students have a broader understanding. Students who have high motivation will have a stronger learning concept, and students will understand that learning is a process of self-change, social development and is a continuous process and is a task that must be carried out (Negovan, et al., 2015). The motivation in question is achievement motivation. Based on the results of research conducted by Pangestika (2018) said that the higher the self-confidence, the higher the student's science achievement motivation.

From the overall calculation, there are five categories of students from each variable, namely: very high, high, medium, low, and very low. For the score of self-confidence in studying biology, the results were obtained with very high criteria as many as 18 students; high as 62 students; medium as many as 19 students; low by 1 student; and very low 0 students (Figure 3). Furthermore, the curiosity score was obtained with very high criteria as many as 30 students; high as 62 students; medium as many as 8 students; low and very low 0 students (Figure 4). And the students' achievement motivation scores were obtained with very high criteria as many as 22 students; high as 57 students; moderate as many as 21 students; low and very low 0 students (Figure 5).

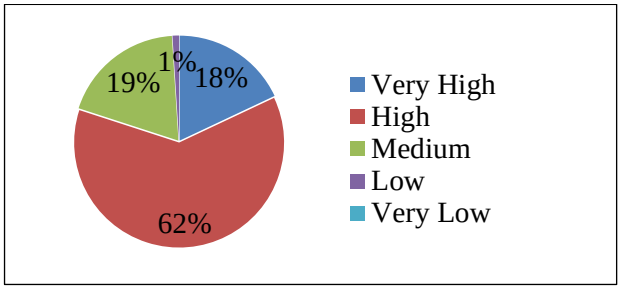

Figure 3
Frequency of Confidence Score Criteria in Studying Biology

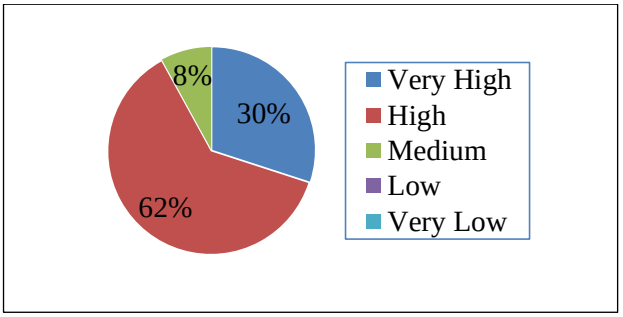

Figure 4
Frequency of Curiosity Score Criteria

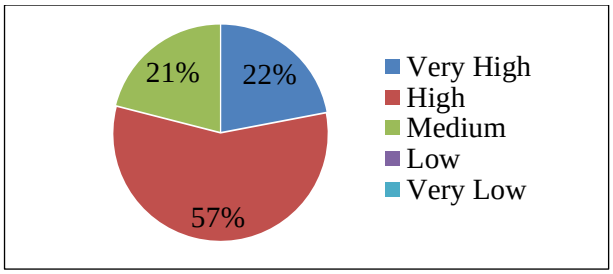

Figure 5
Frequency of Achievement Motivation Score Criteria

Referring to the research results obtained, the results obtained by researchers may differ due to certain other factors that can influence the results of these variables. However, this research is expected to be useful as information material for teachers, students, and researchers about the variables of self-confidence, curiosity and achievement motivation in students.

D. Conclusion

Based on the results of the study, it was concluded that there was a positive correlation between self-confidence in studying biology and curiosity and student achievement motivation. Suggestions that need to be considered for further research are to develop research through appropriate learning models so that it can affect the emergence of

students' self-confidence, curiosity, and achievement motivation so that the scope of further research will be wider.

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