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Analyzing the Correlation Between Self-Esteem, Self-Confidence, and Academic Achievement in Biology

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Abstract: This research is a correlational study that aims to determine the correlation between self-esteem and self-confidence with biology learning outcomes. The research sample was 58 students by purposive sampling. Data collection techniques used questionnaires and documentation of final biology semester assessment scores in odd semesters. The research instrument was a self-esteem questionnaire with 23 statement items and a self-confidence questionnaire with 21 statement items. The data analysis techniques used are the Pearson's correlation test and regression test. Based on the research results, it shows that there is a relationship between self-esteem and self-confidence and student learning outcomes. The correlation coefficient (R) is 0.369, which means the relationship between the three variables is low. In addition, the coefficient of determination (R^2) is 0.137, which means that the contribution of self-esteem and self-confidence to learning outcomes was 13.7%.

Keywords: self-esteem, self-confidence, learning outcomes

INTRODUCTION

Education is an important aspect of life that prepares human resources to become intelligent and high-quality individuals. Education is closely related to the teaching and learning process, which aims to bring about positive changes through learning activities designed to develop a person's potential to become a better individual.

One of the objectives of the learning process is to achieve optimal learning outcomes. When students achieve good grades or learning outcomes, it indicates that they have participated well in the learning process. Students' academic success is influenced by several factors, including internal and external factors (Linda et al., 2019:1). One important internal factor that affects the learning process and plays a key role in improving student achievement is self-esteem. Self-esteem is a fundamental need because it reflects a person's positive or

negative assessment of themselves. Failing to fulfill this need can have negative impacts, such as difficulties in social interactions and a sense of inferiority regarding one's abilities (Irawati & Hajat, 2012:195). A student's self-esteem is determined by how much they value themselves. The more positive a student's self-esteem, the higher their academic performance is likely to be (Verdianingsih, 2017:7).

In addition to self-esteem, students are more likely to succeed in their learning process if they have self-confidence. As stated by Komara (2016:34), self-confidence is the most essential basic capital that enables students to actualize themselves, develop their talents, interests, and potential, and grow into successful individuals capable of achieving academic success. Warman (2013) also emphasized that high academic performance is influenced by high levels of self-confidence, whereas low performance is associated with low self-confidence in learning. With self-confidence, students are more capable of completing their tasks well and potentially improving their learning outcomes.

Based on the author's experience during observation and interviews with biology teachers at one of the Islamic senior high schools (MAN) in Tasikmalaya, it was found that several students had low biology learning outcomes. Furthermore, during the learning process, some students showed a lack of enthusiasm and concentration, did not complete assignments, or were often late in submitting them. Some students were also hesitant to express their opinions and frequently looked at their peers' answers when completing their own. Therefore, both self-esteem and self-confidence are crucial in managing and directing students' learning activities.

The aim of this study is to determine the relationship between self-esteem and self-confidence with biology learning outcomes. Additionally, this study is expected to serve as a reference for future research, particularly research aimed at improving optimal learning outcomes in biology.

METHOD

This study employed a correlational research design. According to Fraenkel et al. (2010: 331), correlational research is similar to causal-comparative research, and is therefore referred to as associational research, meaning it investigates relationships between two or more variables without attempting to influence them.

The research was conducted from October to November 2021 at one of the MAN (Islamic Senior High Schools) in Tasikmalaya City. The target population of this study was Grade XI science students (MIPA) in the 2020/2021 academic year, totaling 5 classes with 174 students. The sample consisted of 2 classes: 28 students from XI MIPA 1 and 30 students from XI MIPA 3, selected using purposive sampling technique.

The data collection techniques used in this study were questionnaires and documentation. The research instruments consisted of a Self-Esteem Inventory (SEI) adapted from Coopersmith (1967), containing 23 valid statements, and a self-confidence questionnaire adapted from Lauster (2015), consisting of 21 valid

items. Prior to data collection, the instruments underwent a try-out, validity testing, and reliability testing. The scales used were the Guttman scale and the Likert scale. Data was collected through the distribution of questionnaires in class.

Documentation was used to gather data from teacher records regarding students' biology learning outcomes, taken from the End-of-Semester Assessment (Penilaian Akhir Semester or PAS) scores for the second semester of the 2020/2021 academic year. Data processing and analysis involved assumption testing, including normality test, linearity test, and multicollinearity test, followed by hypothesis testing using Pearson correlation and multiple regression analysis with the help of SPSS 26 for Windows.

RESULTS AND DISCUSSION

The prerequisite test results using SPSS 26 for Windows at a 5% significance level indicated that the variables self-esteem, self-confidence, and learning outcomes were normally distributed, as each had a significance value greater than 0.050. A linearity test was also conducted, showing a significance value of 0.546 for both the relationship between self-esteem and learning outcomes and between self-confidence and learning outcomes—both greater than 0.05, indicating a linear relationship.

The multicollinearity test showed a tolerance value of 0.694 between the independent variables and a VIF value of 1.441. These results indicate that there was no multicollinearity among the independent variables, as the collinearity statistics were below 10.00. After fulfilling the prerequisite tests, hypothesis testing was conducted. The first hypothesis was tested using bivariate correlation analysis with the help of SPSS 26 for Windows, as shown in Table 1.

Table 1. Bivariate Correlation Test between Self-Esteem and Learning Outcomes.

R	R Square	Adjusted R Square	Std. Error	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.334[a]	.111	.096	3.952	.111	7.023	1	56	.010

Based on Table 1, the significance value is 0.010, which is less than 0.05. This means that the null hypothesis (H_0) is rejected, indicating a significant correlation between self-esteem and biology learning outcomes. The correlation coefficient (R) between self-esteem and students' learning outcomes is 0.334, which falls into the low correlation category. In addition, the coefficient of determination (R^2) is 0.111, indicating that self-esteem contributes 11.1% to students' learning outcomes, while the remaining 88.9% is influenced by other variables.

Based on the research results, it can be seen that the relationship between students' self-esteem and learning outcomes is in the low category. This means that students may still lack appreciation for themselves and may not yet be able to control their behavior in a way that is acceptable to others. Therefore, students

need to develop and enhance their self-esteem, as it affects how they think and learn. When students have low self-esteem, it may disrupt the learning process.

This finding is in line with Sylvia (2016:314), who stated that self-esteem is a key aspect of personality that plays a critical role in shaping behavior, significantly influencing thinking processes, emotional levels, decision-making, and life values, which in turn help individuals to enjoy and engage with life meaningfully. Thus, self-esteem plays an important role in encouraging individuals in general—and students in particular—to achieve better learning outcomes (Nur & Latief, 2016). Accordingly, self-esteem has a crucial role in the learning process, and enhancing it is expected to lead to improved academic performance at school. The second hypothesis was tested using a bivariate correlation test with SPSS 26 for Windows, the results of which are presented in Table 2.

Table 2. Bivariate Correlation Test between Self-Confidence and Learning Outcomes.

R	R Square	Adjusted R Square	Std. Error	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.317[a]	.100	.084	3.977	.102	6.238	1	56	.015

Table 3. Multivariate Correlation Regression Test between Self-Esteem and Self-Confidence with Learning Outcomes.

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.369[a]	.137	.105	3.931	.137	4.348	2	55	.018

Based on Table 2, the significance value is 0.015, which is less than 0.05. This means that the null hypothesis (H_0) is rejected, indicating a significant correlation between self-confidence and biology learning outcomes. The correlation coefficient (R) between self-confidence and students' learning outcomes is 0.317, which falls into the low correlation category. Additionally, the coefficient of determination (R^2) is 0.100, indicating that self-confidence contributes 10% to students' learning outcomes, while the remaining 90% is influenced by other variables.

The findings show that the relationship between self-confidence and students' learning outcomes is categorized as low but positive. This means that some students still lack confidence in themselves, as evidenced by their inability to complete tasks optimally and their lack of responsibility, such as submitting assignments on time. Therefore, self-confidence plays a vital role for students. With self-confidence, they will believe in their abilities, approach tasks with

optimism, and strive to give their best effort, which in turn will lead to optimal results.

According to Mawaddah et al. (2020), students with good self-confidence trust in their abilities and use them to the fullest, resulting in maximum performance. Thus, self-confidence is essential for improving learning outcomes, particularly in biology subjects. Next, the third hypothesis was tested using multivariate correlation regression analysis with the help of SPSS 26 for Windows.

Based on Table 3, the significance value is 0.018, which is less than 0.05. This means that the null hypothesis (H_0) is rejected, indicating a significant correlation between self-esteem and self-confidence with biology learning outcomes. The correlation coefficient (R) between self-esteem and self-confidence with students' learning outcomes is 0.369, which falls into the low correlation category. Additionally, the coefficient of determination (R^2) is 0.137, meaning that self-esteem and self-confidence contribute 13.7% to students' learning outcomes, while the remaining 86.3% is influenced by other variables.

This finding shows that self-esteem and self-confidence play an important role in helping students improve their academic performance. Self-esteem acts as a source of strength that enables individuals to demonstrate their abilities and achieve success in life. Meanwhile, self-confidence is essential for students because those with high confidence will always strive to do their best in everything they do and maintain an optimistic attitude in achieving their goals.

Thus, it can be concluded that self-esteem and self-confidence are positively and significantly related to students' learning outcomes. In other words, both aspects are interrelated and support each other in helping students succeed in the learning process. Recognizing this relationship can serve as a basis for designing effective learning activities that can lead to optimal academic performance.

Furthermore, the researcher categorized the independent variables based on their aspects. The average scores for each aspect of self-esteem are shown in Figure 1. The first aspect, Power, had the lowest average score of 0.59. This indicates that some students still feel unable to manage and control their behavior in a way that is acceptable to others.

The second aspect, Significance, had a moderate average score of 0.73, showing that most students already experience acceptance and popularity in their social environments, as seen through the care, acknowledgment, and appreciation they receive from others. The third aspect, Virtue, had the highest average score of 0.86, suggesting that most students behave according to prevailing ethical and moral standards in their social environment.

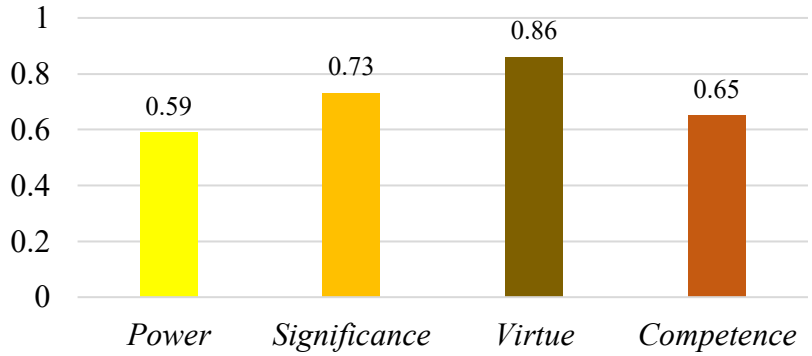

Figure 1. Average Scores of Self-Esteem Aspects.

The fourth aspect, Competence, had a moderate average score of 0.65. This indicates that some students still feel unable to face and solve problems on their own and lack confidence in completing tasks and responsibilities independently. This is evidenced by many students still frequently copying or collaborating with peers during assignments or biology tests. Next, the average scores for each self-confidence indicator can be seen in Figure 2.

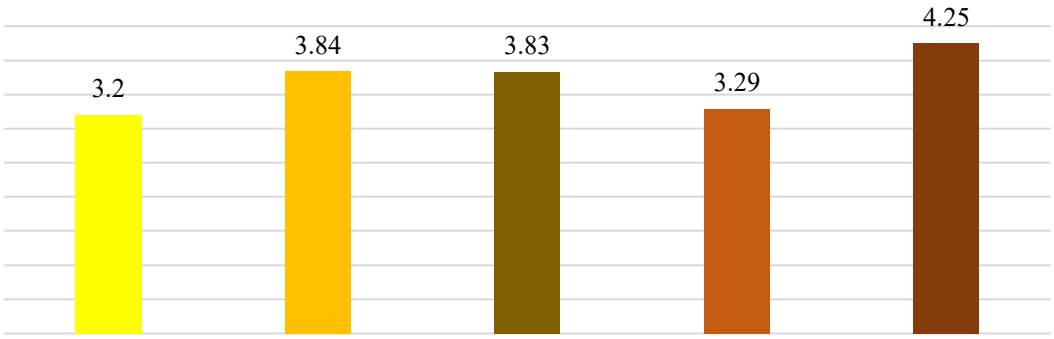

Figure 2. Average Scores of Self-Confidence Aspects: self-esteem, optimistic, objective, responsibility, rational and realistic.

Based on Figure 2, the first aspect—confidence in one's abilities—had the lowest average score of 3.2. This indicates that most students still struggle to make independent decisions, whether in facing problems or during the learning process. The second aspect, optimism, had a moderate average score of 3.84, showing that students have a positive attitude and generally maintain a hopeful outlook, which helps them achieve their desired goals. The third aspect, objectivity, had a moderate average score of 3.83, suggesting that most students can assess situations based on reality. Objective thinking is a trait of individuals with self-confidence, allowing them to judge matters truthfully and take responsibility for their assessments and actions. The fourth aspect, responsibility, had a moderate average score of 3.29, indicating that some students still lack a strong sense of responsibility, as seen in behaviors such as failing to submit assignments on time. The fifth aspect, rational and realistic thinking, had the

highest average score of 4.25, indicating that students are generally able to think logically and realistically.

CONCLUSION

Based on the research findings, data analysis, and hypothesis testing, the researcher concludes that there is a significant correlation between self-esteem and self-confidence with students' learning outcomes. The contribution of self-esteem and self-confidence to learning outcomes is 13.7%, which falls under the low correlation category. Thus, this study indicates that self-esteem and self-confidence can serve as important references for improving student learning outcomes in biology.

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