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The Effect of Self-Efficacy And Self-Regulated Learning on Student's Creativity In Biology Practicum

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Abstract

The aim of this research is to determine whether self-efficacy and self-regulated learning can influence creativity either partially or separately or simultaneously. The population used during the research was classes XI and XII MIPA by taking a sample of 35% of the total population. The research method uses a quantitative method, the Ex Post Fact model. Data analysis techniques were carried out using SPSS with the Classical Assumption Test stages such as Normality Test and Multicollinearity Test. Followed by Hypothesis testing such as Partial Test (T-Test), Simultaneous Test (F-Test), along with the Determination Coefficient R2. Then the hypothesis test is determined using the Ho criterion; There is no influence of self-efficacy or self-regulated learning on creativity. Ha; There is an influence of self-efficacy and self-regulated learning on creativity. The final conclusion of this research is that the results of simultaneous testing with an f-count value of 22.785 are greater than the f-table with a 5% significance level of 3.16 (22.785>3.26) and from these results it can be explained that self-efficacy and self-regulated learning influences student creativity

Keywords: *Creativity, Self-efficacy, Self-regulated learning.*

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INTRODUCTION

One of the subjects required in the curriculum is biology, which in the process must be accompanied by practical work to strengthen theoretical values (Candra & Hidayati, 2020). Practicum has the aim of providing scientific skills to students(Putri, 2021). With practicum, students have the opportunity to observe, analyze, prove and conclude an object they are researching so as to provide direct experience of what they are studying.(Khairunnufus et al., 2019) In the educational process, the factors that greatly influence its implementation are internal factors which include interest, motivation, personal abilities and perspective (Oktariani, 2018; Afrilianti et al., 2022).

Someone who has creativity in thinking will always find new ideas every time they look at an object, this is needed in carrying out practicums (Herianto & Lestari, 2021). The definition of creativity can change according to the theory it is paired with (Rusdi, 2018). According to Haase, creativity theories almost all cover two aspects, namely novelty and usefulness (Haase et al., 2018). Creativity is an interaction between process, talent and the environment as an innate human trait (Rubenstein et al., 2018; Nurluthfiana, 2023). It is hoped that creativity developed from an early age will help a person face problems in the future (Mauludin & Nurjaman, 2022; Rosmayanthi & Arhasy, 2019). However, currently, facts in the field show that creativity in students is a problem that is still often faced (Purwaningsih & Supriyono, 2020). Students who do not understand the lessons choose to do assignments haphazardly without honing their creative abilities (Damayanti et al., 2022).

Based on the results of interviews conducted with biology teachers at MAN 1 Deli Serdang, it was found that there were quite a few students who still lacked creativity. Furthermore, based on the results of interviews with several students, it can be concluded that they are still lazy about studying, find it difficult to carry out practicums and they are not very confident if they have to explain in front of the class the results of the practicums they have carried out. The reason why students often procrastinate studying is because they watch TV, play games until they lose track of time and play social media so they underestimate studying and schoolwork until they end up wasting their time in vain (Handayani & Sholikhah, 2021).

One of the efforts currently being made to increase student creativity is paying attention to student self-efficacy (Habeahan et al., 2023). Self-efficacy refers to the ability to take actions that can influence choices, effort, persistence and achievement (Schunk & DiBenedetto, 2021; Tuzzahra et al., 2023). People who have high self-efficacy will tend to try hard and not give up easily, conversely if their self-efficacy is low then the person will avoid problems (Stajkovic et al., 2018). Students' inability to solve problems can be seen when they carry out practical procedures, they face problems with lack of self-confidence which makes their way of thinking less creative (Khatimah & Fatmah, 2019).

Another effort to increase student creativity besides self-efficacy is self-regulated learning. Student independence, which is usually referred to as self-regulated learning, is a learning process that will influence students' thinking patterns, feelings and actions (Hadayana et al., 2023). Self-regulated learning plays an important role as a form of student responsibility for their education (Jannah et al., 2023). Someone who has good self-regulated learning will determine learning strategies by setting their learning goals (Mabruro, 2023; Rahayu & Imami, 2022).

Judging from the efforts described previously, this kind of research needs to be carried out to provide information about the influence that self-efficacy and self-regulated learning have on student creativity. The findings obtained through this research can be used as a basis for development research carried out in biology learning and practicum, and can be used as a basis for teacher knowledge to increase student creativity in the learning process. Therefore, the aim of this research is to determine the influence of self-efficacy and self-regulated learning on student activity.

METHOD

The research was conducted on 29 May-28 July 2023, located at MAN 1 Deli Serdang which is located at Jl. Limau Manis Pasar XV No 147, Tanjung Morawa District, Deli Serdang Regency. The type of research used is quantitative research with Ex Post Facto research methods. The research is directed at class XI-MIPA and class XII-MIPA for the 2023/2024 academic year. Detailed information regarding population numbers can be seen in table 1.

Sampling in this research used a random sampling technique. The sample used in the research was 62 students or 35% of the total population. The sample size refers to Arikunto's opinion which says that if the population is less than 100 people then the sample is the entire population, but if the population is more than 100 people then the sample can be taken from 10-15% or 20-25% or more.(Riduwan, 2020). The instrument used during the research was a questionnaire. The research procedure began with observing the research site, determining the population and sample size and distributing questionnaires randomly to students in class XI-MIPA and XII-MIPA MAN 1 Deli Serdang. The data collection technique used in this research was interviews and questionnaires. By distributing questionnaire sheets that have been made and distributed to students in class XI-MIPA and XII-MIPA MAN 1 Deli Serdang.

Table 1. Class XI and XII Student Data

Class	The number of students
XI-MIPA 1	36
XI-MIPA 2	34
XI-MIPA 3	34
XII-MIPA 1	36
XII-MIPA 2	35
Amount	**175**

Data Analysis Techniques were carried outusing the help of SPSS ver.29.0 by calculating the Classic Assumption Test such as the Normality Test as an indicator of whether the data is normally distributed or not, and the Multicollinearity Test as an indicator of whether there are data deviations between independent variables or not. Then the Hypothesis Test is determined by the Ho criteria; There is no influence of self-efficacy or self-regulated learning on creativity. Ha; There is an influence of self-efficacy and self-regulated learning on creativity. Hypothesis testing can be seen through the Partial Test (T-Test) process to find out whether the independent variables separately influence the dependent variable, and Simultaneous Test (F-Test) to find out whether the independent variables jointly influence the dependent variable. Then the R2 Determination Coefficient Test was carried out to see how much influence self-efficacy and self-regulated learning contributed to student creativity.

RESULTS AND DISCUSSION

Classic Assumption Test Results

Normality test

The normality test is carried out to determine whether the relationship between the dependent variable and the independent variable is normally distributed. The normality testing technique was carried out with the help of SPSS v.29 using the Kolmogrov-Smirov method. Data is said to be normally distributed if the sig value is > 0.05. The results of the normality test can be seen in table 2,

Table 2. Normality test results

Variabel	Asymp-Sign (2-tailed)	Condition	Conclusion
Residual Unstandarization	0,200	Sig>0,05	Normal

From the test results table above, it can be seen that the significance value is greater than 0.05 (0.200>0.05). Because the Asymp-Sign (2-tailed) value is greater than the significance value of 0.05, it can be said that the data is normally distributed.

Multicollinearity Test

Multicollinearity test was carried out to determine whether deviations occurred between independent variables. The multicollinearity test can be seen if the tolerance value is >0.1 or the VIF value is <10, then it can be said that there is no multicollinearity between the independent variables. The results of the multicollinearity test can be seen in table 3,

Table 3. Multicollinearity Test Results

Variable	Tolerance	VIF	Conclusion
Self-efficacy	0,223	4,491	Multicollinearity does not occur
Self-regulated learning	0,223	4,491	Multicollinearity does not occur

From the test results table above, it can be seen that the tolerance value is > 0.1 (0.233>0.1) or the VIF value is <10 (4.491<10) for each independent variable. So it can be concluded that the regression model of the two independent variables used in the research does not show symptoms of multicollinearity.

Hypothesis testing

Partial Test (t-test)

The t-test was carried out to determine how much influence each independent variable has on the dependent variable separately. The significance level used is 5%. The t-test results can be seen in table 4,

Table 4. Partial Test Results (t Test)

Variable	Dependent Variable Y		
	Regression Coefficients	**t-count**	**Significance**
Konstanta	9,770	1,323	0,195
Self-efficacy	0,468	4,716	0,000
Self-regulated learning	0,375	3,966	0,001

From the table above, it can be seen from the self-efficacy variable that the t-calculated value is greater than the t-table value (4.716>2.001) so it can be explained that self-efficacy has an influence on creativity by 46.8%. It is known for the self-regulated learning variable that the t-count value is greater than the t-table value (33.966>2.001). So it can be explained that self-regulated learning has an influence on creativity by 37.5%.

Simultaneous Test (f Test)

The f test is carried out to see whether the two independent variables together can influence the dependent variable. The f test data can be seen in the anova table in SPSS calculations in column F and the significance value. The two variables can be said to be simultaneous if the f-count value is greater than the f-table value with a significance level of 5% (f-count>f-table). The results of the f test can be seen from the following table 5.

Tabel 5. F test results

	Squm of squares	**Dk**	**Square Mean**	**F-count**	**Sig**
Regression	864.577	2	432,288	22,785	0,000
Residu	1216.471	59	20,618		
Total	2081.048	61			

It can be seen from the table above that the calculated f-value is 22.785, while the f-table value at the 5% significance level is 3.16. So it can be concluded that f-count>f-table (22.785>3.16) which means that the two independent variables jointly influence the dependent variable.

Coefficient of Determination

To find out the accuracy of the regression line on sample data, you can see it through the coefficient of determination table. The coefficient of determination will explain how far the independent variable influences the dependent variable. The results of the coefficient of determination can be seen in the following table 6.

Table 6. Coefficient of Determination Test Results

R Value	R^2 Value	Estimated standard error
0,766	0,587	3.525

Based on the table 6, it can be seen that the value of the coefficient of determination is adjusted to the r square value of 0.587. From this value it can be explained that the independent variables together influence the dependent variable by

58.7%. Meanwhile, the remaining 41.7% is influenced by other variables that are not explained in this research, such as self-action, self-confidence, self-esteem, motivation, interest, learning outcomes and so on.

DISCUSSION

Based on the results of the partial inferential statistical analysis that was carried out for Self-efficacy on the creativity of class XI and Because of the level of significanceα= 5% and the significance value obtained is 0.000 which is smaller than the significance level of 0.05 (0.000 < 0.05) and the t-count obtained is 4.716 which is greater than the t-table 2.001 (4.716 < 2.001), then H0 is rejected and H1 is accepted so it can be concluded that there is a partially significant influence between Self-efficacy on the creativity of class XI and XII-MIPA MAN I Deli Serdang students.

These results indicate that self-efficacy makes a significant contribution to creativity. This is confirmed by previous research conducted by Adju et al. The results obtained were that the t-count value was 2.849 and the t-table value was (2.849>1.290). It can be explained that self-efficacy influences creativity by 0.359 or 35.9% (Adju et al., 2022). This is also supported by Sudjijana's explanation which states that people who have high self-efficacy tend to prefer to do challenging activities such as doing practicums or experiments which are positively related to the nature of creativity (Sudjijana et al., 2020).

Then, based on the results of partial inferential statistical analysis that was carried out on self-regulated learning on the creativity of class XI and Because of the level of significanceα= 5% and the significance value obtained is 0.000 which is smaller than the significance level of 0.05 (0.000 < 0.05) and the t-count obtained is 4.716 which is greater than the t-table 2.001 (3.966 < 2.001), then H0 is rejected and H1 is accepted so it can be concluded that there is a partially significant influence between self-regulated learning on the creativity of class XI and XII-MIPA MAN I Deli Serdang students.

These results indicate that self-efficacy makes a significant contribution to creativity. This is confirmed by previous research conducted by Lesmanawati which showed that the t-count = 13.13 > t-table = 3.88, this means that Ho is rejected and H1 is accepted. This means that the ability to think creatively mathematically for students who have high levels of self-regulated learning (SRL) is higher (Lesmanawati et al., 2020). Supported by an explanation from Damayanti who said that in the process of implementing learning, apart from students' cognitive factors, affective factors such as students' self-regulated learning are also needed to have an influence on the process of learning activities (Damayanti et al., 2022). This is because through self-regulated learning students can regulate themselves to provide learning experiences that will open their insight into problem solving and make them accustomed to thinking creatively.

Furthermore, based on the results of simultaneous or multiple inferential statistical analyzes that have been carried out for Self-Efficacy and Self-Regulated Learning on the creativity of class XI and 0,000. Because the significance value is smaller than the significance level a = 5% or 0.000 < 0.05 and F-count = 22.785 is

greater than F-table = 3.16 or (22.785 > 3.16) then H0 is rejected and H1 is accepted. So it can be said that there is a significant simultaneous influence between Self-efficacy and Self-regulated learning on the creativity of class XI and XII-MIPA MAN I Deli Serdang students. With a sense of confidence in students' abilities in completing easy and difficult tasks, increasing their efforts as best as possible, being able to face obstacles and difficulties and responding to various conditions and situations in a good and positive way, coupled with students' ability to apply strategies. learning strategies in the active and constructive process of students to set goals for their learning process by involving metacognition, motivation, behavior in achieving their learning goals, the researchers concluded that Self-efficacy and Self-regulated Learning are needed by students to increase creativity.

CONCLUSION

The results of this research found that self-efficacy influences creativity with a t-count>t-table value (4.716>2.001), so it can be stated that Ho is rejected and Ha is accepted. Then it was found that self-regulated learning influences creativity with a value of t-count>t-table (3.966>2.001), so it can be stated that Ho is rejected and Ha is accepted. Furthermore, if calculated simultaneously between self-efficacy and self-regulated learning, these two independent variables have an influence on creativity as the dependent variable with the results of f-count>f-table (22.785>3.16) then it can be concluded that Ho is rejected and Ha is accepted

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