CORRELATION BETWEEN STUDENTS' CRITICAL THINKING ABILITY AND SELF-CONFIDENCE ON JUNIOR HIGH SCHOOL

Farid Fadhil Malik[1], Irfan Taufik Nurdin[2], Wahyu Hidayat[3]

[1]IKIP Siliwangi, Jl. Terusan Jend. Sudirman, Cimahi, Indonesia.
faridfadhilmalik@gmail.com
[2]IKIP Siliwangi, Jl. Terusan Jend. Sudirman, Cimahi, Indonesia .
irfantaufiknurdin85@gmail.com
[3]IKIP Siliwangi, Jl. Terusan Jend. Sudirman, Cimahi, Indonesia .
wahyu@ikipsiliwangi.ac.id

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ABSTRACT

One way to improve students' affective and cognitive aspects is through a mathematics learning approach method at school. Achievement of learning objectives (CPL) is demonstrated by the extent to which students have achieved learning objective competencies through a series of criteria or indicators that can be seen from student achievement or learning outcomes. The method in this research uses a non-experimental correlational quantitative research method carried out on class VII students at one of the MTS in Soreang, Kab. Bandung. The aim of this research is to get an idea of how self-confidence influences critical thinking skills or the relationship between critical thinking skills and self-confidence. The results of this research show that the correlation between students' critical thinking skills and self-confidence has a "strong" influence on each other. The conclusion of this research is that Ho is rejected so that Hα is accepted: There is an influence between self-confidence and critical thinking on student achievement or learning outcomes, this means that students' self-confidence and critical thinking greatly influence learning outcomes with the regression model obtained $Y = 32.788 + 0.399X_1 + 0.391X_2$ Positive correlation occurs when the two variables are related to the same status (the linear regression coefficient has a positive sign). If one variable increases, the other variable also increases, and vice versa if it decreases.

Corresponding Author:

Farid Fadhil Malik,
Department of Mathematics Education,
IKIP Siliwangi,
Jl. Terusan Jend. Sudirman, Cimahi, Indonesia
Email: faridfadhilmalik@gmail.com

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INTRODUCTION

Sumarmo & Dedy (1994) states that mathematics teaching should emphasize developing students' mathematical abilities (mathematic power) which include: skills in searching for information, formulating conjectures and thinking logically, solving unusual problems (problem solving) , communicate in mathematical language, and connect mathematical concepts with other intellectual activities (mathematical connections). The importance of critical thinking skills, among other things, is to: 1) Be more open-minded (objective); 2) Easy

to solve problems; 3) Minimizing misperceptions; 4) Knowing your own abilities; 5) Communicate better; 6) Not easily exploited by other people.

The opinion Begle (1979) is that students' optimistic attitude towards mathematics has a positive impact on students' achievement in learning mathematics. Therefore, affective or attitudinal aspects in mathematics learning are very necessary so that students can master competencies, not just cognitive aspects. The affective aspect needs attention in mathematics learning where the object is related to numbers and formulas so that indirectly teachers only focus on the cognitive aspect while the affective influence in mathematics learning receives less attention. A component that is necessary and important for students to have in developing critical mathematical thinking skills is an attitude of self-confidence and confidence in their own abilities, this is so that students avoid feeling worried or anxious and doubtful, because of the factors that influence critical thinking according to Rubenfeld & Scheffer (2014) include: (1) physical condition, (2) anxiety, (3) intellectual development, (4) motivation, and (5) habits.

Since 2000, Indonesia has been a member and has taken *the Program for International Student Assessment* (PISA) exam. Since joining, PISA Indonesia's achievements have always been at an unsatisfactory level. The latest PISA research results in 2018 released by the OECD as the organizer of PISA show that Indonesia's achievements are still low and even tend to decline compared to 2015 (PISA, 2018).
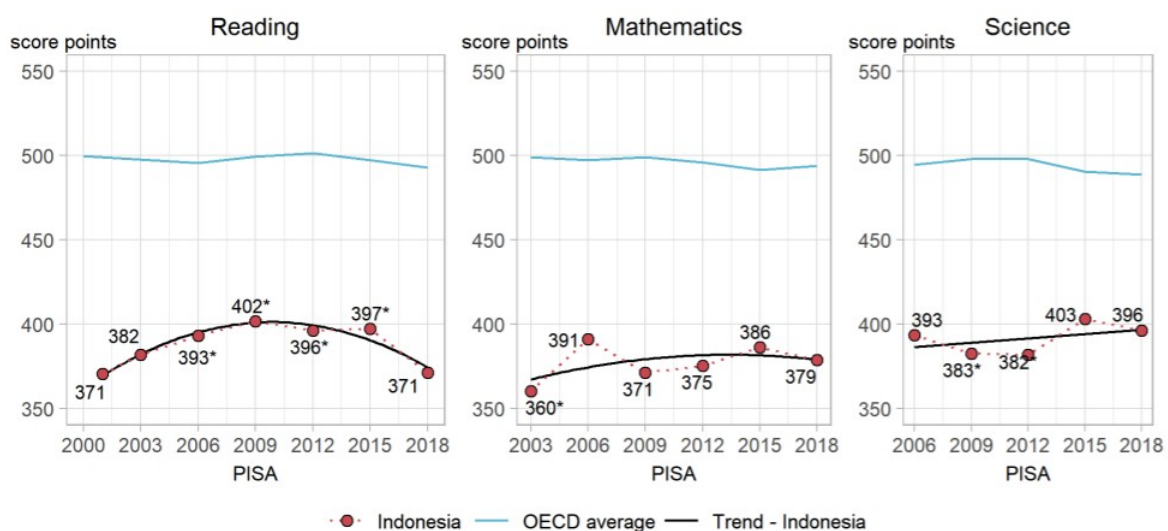
Figure 1. Results from PISA 2018
Source: https://www.oecd.org/pisa/publications/PISA2018_CN_IDN.pdf

From the information above, it can be seen that the 2018 PISA Indonesia results show that Indonesian students' reading ability reached an average of 371 from the OECD average of 487. Furthermore, the average for mathematics reached 379 from the OECD average of 487. Then for science, the figure The average Indonesian student reaches 396 with an OECD average of 489 (OECD, 2018). Based on PISA 2018 information, it shows that Indonesia is in the low category in terms of performance with a high level of equality. Therefore, Indonesia actually still has the opportunity to improve critical thinking skills because it has abilities and potential that have not been utilized optimally. The advanced clarification aspect is an indicator of students' critical thinking abilities which are still relatively low (Yuliani et al., 2021). Critical thinking is a complex process that requires high level cognition in processing information, connecting, and evaluating a problem (Krulik & Rudnick, 1995; Choy & Cheah, 2009).

Based on the facts above, what is very important to do in encouraging increased national competitiveness is improving the quality of human resources. (Dimyati, (2019) stated that one

of the determining factors for the success of a nation's development and progress is improving the quality of human resources. One of the efforts that can be made to improve human resources is to improve the quality in the field of education. An important element that must receive top priority to face competition in the ASEAN Economic Community or global competition is education. Through education, every student is trained to develop self-confidence and critical thinking skills. It is clear that mathematics in schools has a very vital role for students to gain adequate knowledge and shape their attitudes and thought patterns, for society in general to be able to live a decent quality of life, for the progress of the country, and to maintain and develop mathematics itself.

Britain & Cockcroft (1982) put forward several reasons why mathematics should be taught to students, such as: (1) it is always used in all aspects of life; (2) all fields of study require appropriate mathematical skills; (3) is a strong, clear and concise means of communication; (4) can be used to present information in a variety of ways; (5) improve logical thinking skills, accuracy and spatial awareness; (6) provide satisfaction with efforts to solve challenging problems. This aims to equip students with the ability to think logically, analytically, systematically, critically and creatively as well as the ability to collaborate (Harahap & Surya, 2017). With critical thinking students can include understanding and formulating problems, collecting and analyzing necessary and reliable information, formulating assumptions and hypotheses, testing hypotheses logically, drawing careful conclusions, evaluating and deciding what to believe or what to do, and estimating possible consequences (Abdullah, 2016).

One factor that can support students' success in learning mathematics is students' attitudes towards mathematics lessons. Students who understand mathematical principles will have strong self-confidence in overcoming difficult situations (Putra et al., 2018). Motivation to achieve success will be strengthened by self-confidence, because the higher the belief in one's abilities, the greater the motivation to complete the work. His intention to achieve the task target will also be stronger (Hendriana, 2014). If someone has high self-confidence, then he will always try to develop everything until he reaches his potential. Good self-confidence will give students success in learning mathematics, because if students have this, they tend to always fight for their desire to achieve an achievement, in this way they will be successful in learning mathematics (Nelly et al., 2013).

According to Minister of Education and Culture Regulation number 22 of 2006, mathematics is one of the subjects taught to students from elementary school, junior high school, to university. The objectives of teaching mathematics are (1) to improve students' thinking abilities, especially high-level thinking abilities, (2) to form students' abilities in solving problems in a structured manner, (3) to achieve good learning outcomes, (4) to train students in conveying ideas, especially in writing. scientific work, and (5) developing student character (Permendiknas, 2006).

The aim of this research is to obtain an overview of how self-confidence influences critical thinking skills or the relationship between critical thinking skills and self-confidence and an overview of the level of relationship between a pair of variables which include students' self-confidence and critical thinking on achievement or learning outcomes.

METHODS

Correlational research is research conducted by researchers to determine the level of relationship between two or more variables, without making changes, additions or manipulation to existing data (Arikunto, 2014). Meanwhile, according to Suryabrata (2014) correlational research is research with the aim of detecting the level of relationship between variations in a factor and variations in another factor based on the correlation coefficient.

According to Emzir (2004) correlational research carried out in this variety is limited to interpreting relationships between variables, not causality. However, correlational research can be a reference for further research. More briefly Sugiyono (2013) states, this type of correlational research is research that asks about the relationship between two or more variables.

In this research there is three variables namely two variable free and one dependent variable. According to Umar (2003). Independent variables are variables that explain or influence other variables, while dependent variables are variables that are explained or influenced by independent variables.

The independent variables in this research are self-confidence (X_1) and critical thinking (X_2). Meanwhile, the dependent variable is student achievement/learning outcomes (Y).
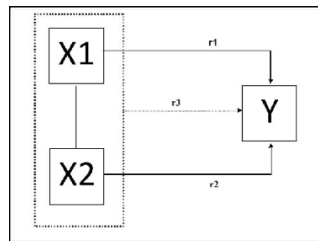
Figure 2. Connection between variables study

Information picture :
X_1 = *Self-Confidence* Variable
X_2 = Variable Critical thinking
Y   = Achievement Variables / Learning Outcomes Student

Correlational research is non-experimental quantitative research, data processing analysis is carried out to measure several variables and their relationships simultaneously in real time . The results of this research will show the high or low level of a relationship between variables, not whether there is a relationship or not . This research can be used to predict certain variables based on the variables.
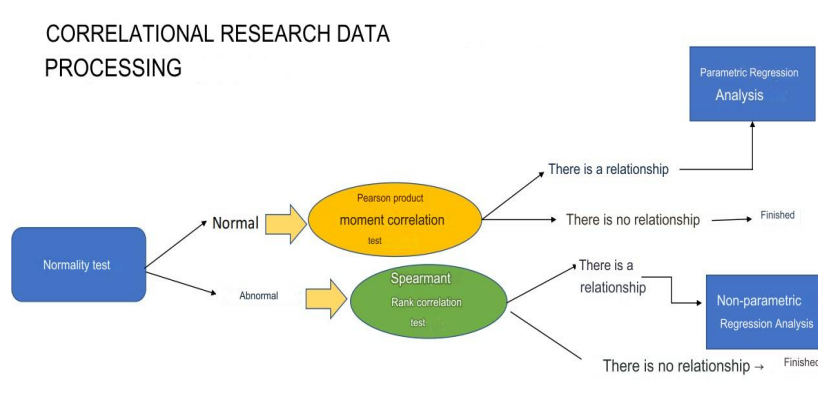
Figure 3. Correlational research data processing chart

A correlational study can produce three possibilities:
1. **Positive correlation** occurs when both variables relate to the same status. If one variable increases, then the other variable also increases, and likewise if it decreases.
2. **Negative correlation** is the opposite of positive correlation. If one variable increases, the other variable decreases, and vice versa.
3. **No correlation** means that increasing or decreasing one variable does not have any influence on other variables.

Table 1. Interpretation of correlation coefficients

Interpretation of correlation coefficients		
0.00 - 0.199	=	Very low
0.20 - 0.399	=	Low
0.40 - 0.599	=	Currently
0.60 - 0.799	=	Strong
0.80 - 1,000	=	Very strong

Source: (Sugiyono, 2013)

Furthermore, from the data processing conclusions, interpret the correlation coefficient shows that there is a relationship between the variables, then the data processing flow continues with the influence test (regression) which is used to see whether or not there is an influence of the independent variable on the dependent variable.

RESULTS AND DISCUSSION

Results

The first stage of data analysis processing carried out is a normality test with the following test criteria:

If Sig. ≥0.05 Then sample comes from that population normally distributed
If Sig. <0.05 Then sample comes from a population that is not normally distributed

Table 2. Normality test results

	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Self_Confidence	.134	32	,155	,959	32	,256
Critical thinking	,091	32	,200 [*]	,957	32	,228
Learning achievement	.121	32	,200 [*]	,947	32	,120

You can see *the output table* in the *Shapiro-Wilk section* for Sig. *Self-confidence* 0.256 , Sig . Critical thinking 0, 228 and Sig. Learning achievement is 0.120 . Value all Sig. ≥0.05, then it can be concluded that the sample comes from that population is normally distributed , thus the requirements for the correlation test are met. For the alternative paired *sample t- test, the parametric Pearson product moment test is then carried out* . Here 's the hypothesis test :

H_0 : There is no relationship between *self-confidence* and critical thinking and student learning outcomes/achievement.
H_a : There is a relationship between *self-confidence* and critical thinking and student learning outcomes/achievement.

Table 3. Output pearson correlations

		Self_Confidence	Critical thinking	Learning achievement
Self_Confidence	Pearson Correlation	1	,079	,366 [*]
	Sig. (2-tailed)		,667	,040
	N	32	32	32
Critical thinking	Pearson Correlation	,079	1	,508 [**]

	Sig. (2-tailed)	,667		,003
	N	32	32	32
Learning achievement	Pearson Correlation	,366 *	,508 **	1
	Sig. (2-tailed)	,040	,003	
	N	32	32	32

In Table. 3. It can be seen how the picture/description of the relationship between students' critical thinking abilities and students' self-confidence is shown in the results of the Pearson correlation data processing with a figure of 0.79, and it can be concluded that the interpretation of the correlation coefficient for critical thinking and students' confidence has a "strong" relationship".

From the results of simple correlation analysis (r), the correlation between *self-confidence* and learning achievement (r) is **0.366** (look again **at Table 1**). From this we can conclude that there is a **low relationship** between *self-confidence* and learning achievement. Meanwhile, for the results of simple correlation analysis (r), the correlation between critical thinking and learning achievement (r) was **0.508,** so there was a relationship in the **Medium category** between critical thinking and learning achievement.

If described, the results of the respective *Pearson correlation outputs are contained in* **the table. 4** *Correlations of self-confidence* with learning achievement and **Table. 5** *Correlations of* critical thinking with learning achievement, as follows:

Table. 4 *Correlations self-confidence with learning achievement*

Correlations

		Self_Confidence	Prestasi_Belajar
Self_Confidence	Pearson Correlation	1	.366*
	Sig. (2-tailed)		.040
	N	32	32
Prestasi_Belajar	Pearson Correlation	.366*	1
	Sig. (2-tailed)	.040	
	N	32	32

Table. 5 *Correlations of critical thinking with learning achievement*

Correlations

		Berpikir_Kritis	Prestasi_Belajar
Berpikir_Kritis	Pearson Correlation	1	.508**
	Sig. (2-tailed)		.003
	N	32	32
Prestasi_Belajar	Pearson Correlation	.508**	1
	Sig. (2-tailed)	.003	
	N	32	32

The last thing in the data processing analysis in this research is the regression test, with the aim of explaining further whether there is an influence of the independent variable on the dependent variable, with the data sample having a normal distribution and the data processing results stating that there is a correlation between the variables.

The output results of data processing for regression testing using SPSS are presented as below:

Table 6. Model Summary

Model Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.604 [a]	,365	,321	1,758	1,787

a. Predictors: (Constant), Critical_Thinking, Self_Confidence

b. Dependent Variable: Learning_Achievement

Table 7. ANOVA results

ANOVA [a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51,547	2	25,774	8,335	.001 [b]
	Residual	89,672	29	3,092		
	Total	141.219	31			

a. Dependent Variable: Learning_Achievement

b. Predictors: (Constant), Critical_Thinking, Self_Confidence

Tabel 8. Coefficients of critical thinking and self-confidence

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	32,788	13,444		2,439	.021
	Self_Confidence	,399	,181	,327	2,206	,035
	Critical thinking	,391	,120	,482	3,250	,003

Table 9. Lower and upper bound of critical thinking and self-confidence

Coefficients [a]

Model		95.0% Confidence Interval for B	
		Lower Bound	Upper Bound
1	(Constant)	5,292	60,284
	Self_Confidence	,029	,769
	Critical thinking	,145	,637

a. Dependent Variable: Learning_Achievement

From the output results obtained (regression test: **Tables 6, 7, 8, and 9**), the following conclusions are obtained:

1. The correlation between the variables is **0.604** .

2. The R-square of **0.365** indicates that the model can explain/describe the behavior of the data of **0.365** and the rest is influenced by other factors.

3. Big Sig. **0.001**.

   With hypothesis testing ,

   H_0 : There is no influence between *self-confidence* and critical thinking and student learning outcomes/achievement.

Ha : There is an influence between *self-confidence* and critical thinking and student learning outcomes/achievement .

Test criteria:

If (Sig.) > α then H_0 is accepted, the conclusion is that H_0 is rejected which means = There is an influence between *self-confidence* and critical thinking and student learning outcomes/achievement.

4. The regression model obtained is Y = 32.788 + 0.399 Positive correlation occurs when the two variables are related to the same status (the linear regression coefficient has a positive sign). If one variable increases, the other variable also increases, and vice versa if it decreases.

Discussion

From the results of data processing in this study, it was found that the degree of correlation between critical thinking skills and self-confidence was 0.79, which shows that these two variables have a correlation with each other with the influence of the "strong" category, this is in line with research Tresnawati et al. (2017) which concluded that the correlation coefficient was 0.863 and the coefficient of determination was 0.746, so that students' self-confidence significantly had a positive influence on students' mathematical critical thinking abilities at a significance level of 5%.

Correlation analysis is used to measure the high or low degree of closeness. A correlation coefficient that is close to +1 means there is a close positive relationship, if it is close to -1 it means there is a close negative relationship. Meanwhile, the correlation coefficient is close to 0 (zero), meaning the relationship between the two variables is weak or not close. Thus the correlation coefficient value is $-1 \leq r \leq +1$. For a correlation coefficient equal to -1 or +1, it means that the relationship between the two variables is very close or very perfect and this very rarely happens in real data (Santoso & Madiistriyatno, 2021).

Regression analysis is an analysis that aims to determine the influence of a variable on other variables. In regression analysis, the variable that influences is called the independent variable and the variable that is influenced is called the dependent variable. If in the regression equation there is only one independent variable and one dependent variable, it is called a simple regression equation, whereas if there is more than one independent variable it is called a multiple regression equation (Sahir, 2022).

Correlation and regression both have a very close relationship. Every regression must have a correlation, but the correlation is not necessarily significant with the regression. Correlation that is not followed by regression is a correlation between two variables that do not have a causal or functional relationship. To determine whether the two variables have a causal relationship or not, it must be based on theories or concepts about the two variables(Susanti et al., 2019; Roflin & Riana, 2022).

Achievement of learning objectives (CPL) will be realized from a learning approach method process, because this is related to the cognitive and affective aspects of students where there are variables that will and must be improved, so that they will influence student learning outcomes/achievement.

CONCLUSION

Based on the results and discussion obtained from this research, including:

1. All sample data processed comes from the population normally distributed with a Sig value. *Self-confidence* 0.256, Sig. Critical thinking 0,228 and Sig. Learning achievement is 0.120.

2. It can be concluded that the interpretation of the correlation coefficient for critical thinking and student confidence has a "strong" relationship. The relationship between students' critical thinking abilities and students' self-confidence is shown in the results of the Pearson correlation data processing with a figure of 0.79 in the "strong" category.

3. *The Pearson correlation self-confidence* result is 0.366 with Sig. 0.040 and *the Pearson correlation* for critical thinking is 0.508 with Sig. 0.003, n correlation coefficient value is between $-1 \leq r \leq +1$, in the "Low" and "Medium" categories. Both Sig values. <0.05 which indicates H_0 rejected and H_a accepted, meaning that there is a relationship between *self-confidence* and critical thinking and student learning outcomes/achievement (relationship between variables).

4. Sig value. 0.001, so that H_0 is rejected which means There is an influence between *self-confidence* and critical thinking and student learning outcomes/achievement. Based on the results of the regression analysis, it can be seen that there is a relationship in the "Strong" category that influences the variables, with an R value of 0.604, the R-square of the data model is 0.365 and the rest is influenced by other factors.

5. Regression model $Y = 32,788 + 0,399X_1 + 0,391X_2$ The linear regression direction coefficient has a positive sign, thus causing a positive correlation.

THANK-YOU NOTE

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