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THE RELATIONSHIP OF NUMERACY LITERACY SKILLS TO SELF EFFICACY IN JUNIOR HIGH SCHOOL STUDENTS

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Abstract

This study aims to describe the relationship between numeracy literacy skills and self-efficacy of private junior high school students in Bandung City, namely SMP Muhammadiyah 6. This study uses multivariate correlation method with a sample of 10 students with random sampling technique. The instruments used in this research are numeracy literacy test and self-efficacy questionnaire. The data were processed by descriptive and inferential quantitative methods. The results showed that students' numeracy literacy skills from the test results and questionnaire results showed no influence between the two variables. The conclusion of this study is that students who have low or high numeracy literacy skills have no influence on self-efficacy, this is based on the results of student questionnaires.

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INTRODUCTION

Mathematics, as a worldwide discipline, serves as the cornerstone for the advancement of contemporary technology, playing a crucial role across various fields and fostering cognitive development in humans (Susetyawati & Kintoko, 2022). Understanding mathematics can develop other mathematical skills and is the basis for solving problems (Khoerunnisa et.al, 2023; Nuriah et.al, 2023). Nowadays, many people experience anxiety disorders, this will affect a person's level of self-confidence, anxiety means a sense of insecurity and comfort that comes from their own mind (Salvia et al., 2022). As a student, this anxiety is one of the influences that becomes an obstacle in the educational process. The influence of education in human life in society is very important, the high level of education plays an important role in determining the quality of human resources. To realize these ideals, the government requires a minimum of 12 years of study so that it becomes a provision to navigate life in society. The formation of personality and self-confidence of students is strongly influenced by the environment and background of

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students. As students' age and education level increase, self-confidence must be possessed to be able to adjust to their academic environment (Mellyzar, Ratna Unaida, Muliani, 2021).

Awareness of the importance of education is carried out by individuals with the support of the government to realize the achievement of the objectives of the education system. According to the Republic of Indonesia Law number 20 of 2003 regarding the National Education System, education is a deliberate and organized endeavor aimed at establishing an environment and process of learning, enabling students to actively cultivate their potential in religious spirituality, self-discipline, personality, intellect, moral character, and the essential skills required for their own benefit as well as for the welfare of society, the nation, and the state (Nurtiana & Adirakasiwi, 2022). With the need for an appropriate school management system, relevance to all aspects that can develop the potential in students. One of the educations that can develop students' potential is mathematics education (Refiona Andika, 2021).

Education plays an important role in personality formation, both in an Islamic perspective and in a psychological perspective, causing a relationship between other humans, education and psychology have a close correlation, so that how attitudes and behavior are in accordance with religious teachings because of the educational process. The formation of personality and self-confidence of students is strongly influenced by the environment and background of students. As the age and education level of students increase, the confidence they must have to be able to adjust to their academic environment is called Self-efficacy. Self-efficacy is the belief we have in our own abilities, specifically our skills to face the challenges ahead of us and complete tasks successfully (Akhtar, 2008). The higher the self-efficacy, the better the effectiveness of student learning (Toharudin et al., 2019). Students who exhibit a strong sense of self-efficacy demonstrate proficiency in managing, executing, and resolving issues associated with their learning assignments, all while maintaining the assurance that they are capable of completing the tasks effectively (Bandura, 2013).

The higher the self-efficacy value, the student will fulfill the 3-point indicator in understanding, this is evidenced by the high enthusiasm in learning, doing the task until completion and trying as much as possible in working on difficult problems by students. The lower the self-efficacy, the students prefer tasks that are considered easy to do, and the level of difficulty is adjusted to the student's skills and choose certain tasks that are in accordance with their abilities that they believe they can do well and tasks that are believed to be too difficult, they tend to avoid and ignore. So Self efficacy can affect a person's life, he can do his job well if his thoughts and tasks can interact optimally (Latifah & Ratnaningsih, 2022).

Numeracy literacy is one of the competencies that students must achieve in the government program *Asesmen Kompetensi Minimum* (AKM) as a measure of learning and school quality. The concept of numeracy literacy relates to mathematical concepts such as reasoning, analyzing, and interpreting data to solve problems in everyday life (Hadi & Zaidah, 2021). The low numeracy literacy skills in Indonesia can be seen from TIMSS data where Indonesia scored 395 out of an average of 500. The factors causing this low-skills can be caused by a lack of curiosity about concepts, theories, principles, the state of the social environment and the state of the concept itself. (Arahmah et al., 2021)

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This research was conducted on students in grade VIII at SMP Muhammadiyah 6 Bandung. The purpose of this study was to determine the relationship between numeracy literacy skills and self-efficacy of junior high school students and to determine the effect of numeracy literacy skills on self-efficacy of junior high school students.

The researcher hopes that the research conducted is useful to find out the relationship between numeracy literacy skills and student self-efficacy which will show the influence between the two so that it becomes an evaluation material in the learning process.

METHOD

The method in this study is the correlation analysis method, which will analyze the relationship between two variables, namely the independent variable and the dependent variable. The independent variable in this study is numeracy literacy skills, while the dependent variable is student Self Efficacy. The population in this study were 8th grade students at SMP Muhammadiyah 6 Bandung in collecting data, each student was given 2 research instruments, namely the numeracy literacy test instrument and a non-test. The numeracy lexical skills test instrument is in the form of 5 description questions taken from AKM questions, while the self-efficacy questionnaire is in the form of 13 statements with 8 positive questions and 5 negative questions. The data analysis used is quantitative with a correlation test that aims to see whether there is a relationship between the two variables. The data were collected and then processed using linear regression test and correlation test, but previously normality test and linearity test were conducted.

The instruments given are in the form of tests and non-tests, the Numeracy Literacy Skills test, with indicators of formulating situations in the form or mathematical models using appropriate representations, using mathematical concepts, facts and procedures to solve everyday problems, Interpreting and communicating the results or solutions of mathematical problems, crafting arguments rooted in mathematical data or solutions to mathematical problems. Conversely, non-test self-efficacy pertains to the confidence in understanding mathematical concepts, completing math-related tasks, achieving learning goals in mathematics, and demonstrating resilience and perseverance in the process of learning mathematics.

RESULTS AND DISCUSSION

After conducting the research, it was found that the achievements of students' numeracy literacy skills are presented in the following table.

Table 1. Recapitulation of the average achievement of numeracy literacy skills

No	Indicator	Average (%)	Categori
1	Formulate situations in the form or mathematical models using appropriate representations	56	Sufficient
2	Use mathematics concepts, facts, and procedures to solve everyday problems	41	Less
3	Interpret and communicate the results or solutions of mathematical problems	49	Less
4	Make arguments based on mathematical information or solutions to mathematical problems	34	Less

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The numeracy literacy test instrument consists of 5 questions with 4 indicators that cover all questions. Based on table 1, for the first indicator, namely formulating situations in mathematical form or models using appropriate representations of 56%, this indicator has the highest representation, most students can solve this problem. The second indicator is using mathematical concepts, facts, and procedures to solve everyday problems has 41% representation. While the third indicator, namely interpreting and communicating the results or solutions of mathematical problems, has a representation of 49%, and finally the fourth indicator, namely making arguments based on mathematical information or solutions to mathematical problems of 34%, is also the indicator that has the lowest representation, this illustrates the skills of students in this indicator is still lacking.

The following table presents the results of the self-efficacy questionnaire, this questionnaire consists of 13 questions, with details of 8 positive questions and 5 negative questions, as follows:

Table 2. Results of Self-Efficacy Questionnaire

Category Number of Average Score (%)	Number Score	Average (%)
Positive Statement	281	70,2
Negative Statement	136	54,4

From table 2, it is obtained that the average percentage of students who answered positive questions was 70.2%, but the average of students who answered negative questions was 54.4%. Here it can be seen that the percentage of positive questions is higher than the percentage of negative questions, even so it can be concluded that students' self-efficacy skills has increased.

The first statistical test used is the normality test, the data used is Numeracy Literacy Skills and self-efficacy, the normality test used is the Kolmogorov-Smirnov test with a significance level of 0.05 with the hypothesis: Ho: Normally distributed data, Ha: Data not normally distributed, and Test criteria: if significance ≥ 0.05, then Ho accepted, and if the significance is ≤ 0.05 then Ha is accepted, and Ho is rejected. The following presents the results of the normality test using SPSS, namely the numeracy literacy instrument data and the self-efficacy questionnaire.

Table 3. Normality Test Results of Numeracy Literacy and Self-Efficacy Data

Tests of Normality

	Kolmogorov-Smirnov[a]		
	Statistic	df	Sig.
Literasi Numerasi	.245	10	.091
Self-efficacy	.233	10	.132

Lilliefors Significance Correction

Based on Table 3. The significance value for numeracy literacy test data is 0.091 and the significance value for self-efficacy test data is 0.132, both values are ≥ 0.05, so Ho is accepted, meaning that numeracy literacy and self-efficacy data are normally distributed.

It was found that both data were normally distributed and then the linearity would be tested with the help of spss, with the test criteria: If the value of deviation from linearity

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sig. ≥ 0.05 then there is a linear relationship between self-efficacy and mathematical communication skills. The following presents the results of the linearity test between self-efficacy and mathematical communication skills with the help of SPSS.

Table 4. Linearity Test Results between Numeracy Literacy Skills and Self-Efficacy

			Sum of Squares	Df	Mean Square	F	Sig.
Self-efficacy Literasi Numerasi	*Between Groups	(Combined)	101.433	4	25.358	.293	.871
		Linearity	5.272	1	5.272	.061	.815
		Deviation from Linearity	96.161	3	32.054	.370	.778
	Within Groups		432.667	5	86.533		
	Total		534.100	9			

Based on Table 4. Obtained Sig value. For deviation from linearity of 0.778 ≥ 0.05, it can be concluded that there is a significant linear relationship between numeracy literacy skills and student self-efficacy. Next, we will test whether there is an effect of numeracy literacy skills on self-efficacy using regression test, with testing criteria: If the sig. ≥ 0.05 then there is no effect of numeracy literacy skills on student self-efficacy. The results will be presented in Table 5. recapitulation of regression test results using SPSS assistance.

Table 5. Recapitulation of Regression Test Results between Numeracy Literacy and Self-Efficacy

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.272	1	5.272	.080	.785[b]
	Residual	528.828	8	66.103		
	Total	534.100	9			

a. Dependent Variable: Self-efficacy

b. Predictors: (Constant), Literasi Numerasi

Based on Table 5, obtained Sig value = 0.785 ≥ 0.05, it can be concluded that there is no effect of numeracy literacy skills on self-efficacy of junior high school students. Then in table 6, the regression equation will be presented, as follows:

Table 6. Regression Equation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	39.522	8.130		4.861	.001
	Literasi Numerasi	.032	.112	.099	.282	.785

a. Dependent Variable: *Self Efficacy*

Based on Table 6, the constant value is 39.522 while the regression coefficient value is 0.032, then the regression equation Y = 0.032X + 39.522 can be made, the negative coefficient value can be interpreted that numeracy literacy skills have no effect on student self-efficacy. To further strengthen, we will analyze the relationship between numeracy

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literacy skills and self-efficacy, and the Pearson correlation value is presented in Table 7 below.

Table 7. Correlation Coefficient between Numeracy Literacy and Self-Efficacy

Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.099[a]	.010	-.114	8.130

a. Predictors: (Constant), Literasi Numerasi

Based on Table 7, the Pearson correlation coefficient between numeracy literacy and self-efficacy is 0.099, indicating that there is no correlation between numeracy literacy and self-efficacy. The correlation coefficient is also negative, indicating that numeracy literacy and self-efficacy have a negative relationship. Table 7 also shows the determination of the correlation coefficient of 0.10%, this means that numeracy literacy skills only affect self-efficacy by 0.10%.

After analyzing although the numeracy literacy and self-efficacy data are normally distributed and there is a significant relationship after the linearity test, but after the regression test to determine the effect of numeracy literacy on self-efficacy, both results show that there is no effect. Students who have numeracy literacy skills do not necessarily have self-efficacy in mathematics, this is based on the low results of student questionnaires.

Self-efficacy is self-confidence in achieving goals and overcoming the problems faced. Self-efficacy is one of the internal factors in students' success (Fitrianna et.al, 2018; In'am and Sutrisno, 2021). learning mathematics Students' self-confidence is built over a long period of time or process based on their experiences. Another case with numeracy literacy skills faced by students is the need for competence in understanding good mathematical concepts and also being able to read and understand the context of the problem in a problem that will be solved with the concept of numbers.

The results of this study show that numeracy literacy skills are not influenced by self-efficacy. It happens because confidence is not a determining factor for students in understanding number concepts in the context of problems. The results of research by Ramdhani et.al (2017) showed that high, medium, and low self-efficacy mastered mathematical understanding indicators according to the level of understanding ability of each student. This means that the ability to understand concepts depends on the understanding of each student and is not influenced by self-efficacy.

High self-efficacy occurs because of the process and experience of students in achieving goals and dealing with problems in general, while in numeracy skills students must understand the concept of numbers well which is applied in everyday life. This shows that the main basis for students to have good numeracy skills must be supported by the ability to understand good number concepts and be able to be literate in the problems to be solved.

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CONCLUSION

Based on the results of the above research, it can be concluded that numeracy literacy has no influence on self-efficacy. Students who have numeracy literacy skills do not necessarily have self-efficacy in mathematics, this is based on the low results of student questionnaires. Based on the results of the research that has been done, the researcher suggests several things, namely this research is expected to provide benefits for researchers to explain the relationship between numeracy literacy skills and self-efficacy of junior high school students and the results of the study are expected to be useful for readers to be developed by further researchers.

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