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Self Efficacy on Mathematics Learning Outcomes of Elementary School Students The Impact of Online Learning

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ABSTRAK

Sejak pandemi Covid 19 menyebar di Indonesia, seluruh satuan pendidikan menerapkan program pembelajaran jarak jauh. Siswa diharuskan memahami materi, menyerahkan tugas secara online. Hal ini mengakibatkan perlunya kita mengetahui tingkat kesulitan dan efikasi diri siswa selama pembelajaran daring. Selain itu pembelajaran daring sulit mengukur kemampuan afektif siswa. Salah satu kemampuan afektif yang sangat perlu dimiliki oleh siswa adalah kemampuan self-efikasi diri. Penelitian ini bertujuan untuk menganalisis pengaruh efikasi diri terhadap hasil belajar matematika siswa kelas V sekolah dasar. Jenis penelitian ini yaitu penelitian kuantitatif. Sampel penelitian ini adalah siswa sekolah dasar di Kecamatan Ayah sebanyak 60 orang dengan penelitian expo facto. Penelitian ini menggunakan pendekatan kuantitatif dengan teknik pengumpulan data menggunakan skala psikologis. Teknik analisisnya menggunakan regresi linier sederhana dan sebelumnya telah dilakukan uji prasyarat berupa uji normalitas, uji linearitas, dan uji heteroskedastisitas. Berdasarkan hasil penelitian dapat diketahui bahwa efikasi diri mempunyai pengaruh yang signifikan sebesar 63,7% terhadap hasil belajar matematika. Namun diketahui bahwa pada saat pelaksanaan pembelajaran tatap muka terbatas, siswa belum sepenuhnya menguasai materi dan materi pelajaran yang dipelajari sebelumnya.

ABSTRACT

Since the COVID-19 pandemic spread in Indonesia, all educational units have implemented distance learning programs. Students are required to understand the material and submit assignments online. This results in the need for us to know students' difficulty levels and self-efficacy during online learning. Besides that, online learning makes measuring students' affective abilities difficult. One of the affective abilities that students need to have is self-efficacy. This study aims to analyze the influence of self-efficacy on the mathematics learning outcomes of fifth-grade elementary school students. This type of research is quantitative research. The sample for this research was 60 elementary school students in Ayah District using expo facto research. This research uses a quantitative approach with data collection techniques using a psychological scale. The analysis technique uses simple linear regression, and prerequisite tests have been previously carried out in the form of normality tests, linearity tests, and heteroscedasticity tests. Based on the research results, it can be seen that self-efficacy has a significant influence of 63.7% on mathematics learning outcomes. However, it is known that when face-to-face learning is limited, students have not fully mastered the material and subject matter studied previously.

1. INTRODUCTION

The distance learning process during school closures due to the impact of COVID-19 cannot be carried out optimally due to various limitations, including that teachers cannot directly utilize various information and communication technology (ICT) devices and online learning platforms that are widely available to support implementation. distance learning, either because of the ability of teachers, parents' economic factors, limited internet access, or the absence of guidance (Azhari & Fajri, 2022; Siahaan, 2020). n the 3T region (Lagging, Frontier, Outermost) especially in border areas, online learning is difficult to do because of limited internet access (Alfiandri et al., 2021; Anugrahana, 2020). The ability of teachers to utilize Information and Communication Technology (ICT) in developing online learning media is also still lacking (Dwiyanti et al., 2021; Lim et al., 2015). In addition, online learning is difficult to measure

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students' affective abilities. One of the affective abilities that students really need to have is *self-efficacy* abilities *Self-efficacy* determine how people feel, think, motivate themselves and act. Mathematical self-efficacy is confidence in the ability to present and solve mathematical problems, how to learn or work in understanding concepts and completing tasks and mathematical communication skills with peers and teachers during learning. This ability is measured based on *the level* (level of problem difficulty), *strength* (resilience) in solving problems, *generality* (broadness) of the given problem area (Alshatri et al., 2019; Retnawati et al., 2017). Based on observations made by researchers, as many as 80 elementary school students in Class V as much as 34% gave up in doing math assignments, 29% had difficulty doing math assignments, 32% students were not confident in doing math assignments. This indicates a lack of *Self Efficacy* and low student learning outcomes. The results of interviews with teachers revealed that students lacked confidence in doing math assignments marked by relying on friends, then enthusiasm in doing work because they were accustomed to online learning, and there were still many students whose math scores were less than the KKM.

From the explanation above, it shows that some students experience problems of lack of self-confidence or *self-efficacy* that affect student learning outcomes. Thus, we can explain that the impact of a pandemic situation like now is enough to make students unsure of their abilities in completing school assignments. Learning outcomes can be interpreted as the maximum results that have been achieved by a student after experiencing the teaching and learning process in studying certain subject matter (Ahmad Syafi'i et al., 2018; Yunus et al., 2021). In relation to mathematics, *self-efficacy*is a person's assessment of his own abilities, both in solving certain mathematical problems, doing tasks related to mathematics, or succeeding in fields related to mathematics (Girelli et al., 2018; Pardimin, 2018). *Self-efficacy* (Jatisunda & Gillar, 2017; Novita & Hidayah, 2016) is a belief or belief held by each individual in carrying out and completing the tasks faced, in certain situations and conditions so that they are able to overcome obstacles and achieve the goals that have been set. Confidence in self-ability is something that a person must have with that belief, so that a person can do or complete a challenge that he or she experiences as well if it is associated with student learning outcomes. With confidence in their abilities, students can overcome the problems they face and can obtain good learning outcomes. Therefore, *Self Efficacy* is something that must be instilled in students so that it becomes a provision specifically in the learning environment and in general in the wider environment. such as work environment and society.

Research shows that self-efficacy positively predicts pleasure and negatively predicts participants' displeasure in learning lesson content (Boakye, 2015; Widyastuti & Haerudin, 2022). In addition, other studies have shown that self-efficacy positively predicts pleasure, but negatively predicts anger, anxiety and boredom (La Ode Onde et al., 2021; Mamolo, 2022). Learning outcomes are generally influenced by both intrinsic and extrinsic factors, with one of the cognitive processes that becomes their determining factor is *self-efficacy*. It is said that adolescents with *self-efficacy* show progress in a number of aspects of achievement (Alshatri et al., 2019; Hestiningtyan et al., 2021). Found that *self-efficacy* predicts mathematics performance as well as other motivational variables that affect overall mathematics achievement. Students with *self-efficacy* math high graders tend to seek out other challenging Math tasks, as well as Math-related subjects. On the other hand, students with *self-efficacy* usually attend Mathematics lessons and seek Math-related tasks only when it is required or they are pressured by their parents (Bringula et al., 2021; Murphy, 2020). This is reflected in their behavior that shows good spirit in doing assignments, such as submitting assignments on time, never complaining when given an assignment, and always trying to do the assigned task even though it has a high level of difficulty. Whereas those who have low levels of self-efficacy tend to choose certain tasks according to their abilities and do them well, but if the tasks are believed to be too difficult, they tend to avoid and ignore them. The behavior shown is refusal of tasks that are considered complex, easy to complain when given a task with a short time span, often submit it late, and easily give up on difficult tasks. This explanation emphasizes that the nature of self-efficacy is not oriented to a person's ability to complete a given task, but rather to the belief that he is able to complete various tasks that have been given. This is in line with the explanation (Arens et al., 2022; Lee & Kung, 2018) of his ability to master new skills or tasks related to certain academic domains.

also found that children with *self-efficacy* will be superior in solving new math problems than children with *self-efficacy*, when controlling for previous performance (*prior performance*). In addition, children with *self* will show a harder effort, for example by persisting longer in reworking the questions that were answered incorrectly. Thus, *self-efficacy* is very much needed in the transitional period of limited online learning to face-to-face in order to improve student learning outcomes supported by research statements (Lailiyah et al., 2021; Nurhayati et al., 2019)showing that 29.6% of student learning outcomes are influenced by *self-efficacy*. *Self-efficacy* in the academic realm will always be related to the academic realm of student achievement. This is because students with high self-efficacy will have a stronger interest in doing academic tasks through clear goals and try their best to achieve them so that

later a good work system will be created and accompanied by perseverance. If it is understood that way, then academic self-efficacy will have a significant relationship to high academic achievement. Various studies have shown that this relationship is positive and significant (Basith et al., 2020; Malik et al., 2015). Various studies on self-efficacy that focus on college students as research subjects have produced various findings surveyed the contribution of self-efficacy to students' academic achievement (Sari, 2020; Yang et al., 2021). This study took a sample of 98 students. The results of the study were analyzed using simple linear regression, which proved that self-efficacy had a positive contribution to student achievement ($F = 16.507$, $p < 0.05$). Based on previous research conducted partially states that the *self-efficacy* has a direct and significant effect on the learning achievement variable. The difference between this study and previous research lies in the face-to-face learning process before the COVID-19 pandemic, in contrast to the current learning conditions conducted online and face-to-face is limited (Adedoyin & Soykan, 2023; Fitriana, 2015). Therefore, the purpose of this study is to determine the effect of *self-efficacy* on mathematics learning outcomes. The hypothesis of this study is that there is a significant influence between *self* -efficacy and mathematics learning outcomes.

2. METHOD

This study used a quantitative approach with ex post facto research because this research was to study the effect of two variables, namely the independent variable (Effect of self-efficacy) and the dependent variable (Mathematics Learning Outcomes) (Olivier et al., 2019; Siregar, 2021). This study aims to analyze the effect of self-efficacy on the mathematics learning outcomes of fifth grade elementary school students. The population in this study were all public elementary schools in Ayah District for the 2021/2022 academic year. The population was then used as a sample of 60 students (24 boys and 26 girls) using a simple probability sampling technique, namely random sampling (Dhawan, 2020; Dogan, 2015). The collection was carried out using a Likert scale. The questionnaire contains 20 questions/items based on instruments that have been made from 3 aspects of self-efficacy. Complete the questionnaire by selecting 1 (one) of 4 (four) options/levels, namely for self-efficacy (strongly agree, agree, disagree, and strongly disagree). To test the validity and reliability of the instrument to be used, the researcher first conducted a validity test on expert judgment according to psychological variables. Then distribute the instruments to 45 students who are not used as research samples. The results of the pilot study show that all statement items are valid and reliable, with a Cronbach alpha value of 0.907. This means that this instrument is feasible to use in this study. While student learning outcomes are taken from PTS student scores. Questionnaires that have been made and tested for validity and reliability are then immediately distributed to the research sample. After the data was collected, it was analyzed using SPSS version 22.0. To test the first research hypothesis, the data analysis technique used was descriptive statistics (mean, standard deviation, frequency, and proportion. For the second question, the analysis technique used was simple linear regression. The significance level for all data analysis was 5%. Validity and reliability tests were carried out on 30 students who were not included in the research sample which were analyzed with SPSS 22. The validity test was done by comparing the numbers from r count and r table with the result that all items had r table more than 0.3 so that they were declared invalid. The reliability test uses the Cronbach's alpha test with a result of 0.753 which is greater than 0.6 so that it is declared reliable or reliable.

3. RESULT AND DISCUSSION

Result

Data were obtained from the fifth grade elementary school students, totaling 60 students who had limited face-to-face learning. 25 are male and 45 are female. Existing data were then tested using normality, linearity, and heteroscedasticity tests using SPSS 22 to determine data with normal and linear distribution. The results of the classical assumption test using SPSS software show that the research data is normally distributed, linear and heteroscedastic. The Kolmogorov-Smirnov Z value is 0.113 and the Asymp value. Sig. (2-tailed) which is 0.137 greater than 0.05, it can be seen that the research variables are normally distributed. Linearity test with a significant value of Deviation from Linearity of 0.964 greater than 0.05 means that the relationship between variables X to Y is linear. In addition, the heteroscedasticity test with the glejser test obtained a significant value of 0.764 greater than 0.05, so it can be concluded that there are no symptoms of heteroscedasticity in the regression. Through the distribution of questionnaires and documentation obtained the results of research on the level of *Self Efficacy* and student learning outcomes. The distribution of questionnaires was carried out to determine the level *self-efficacy* and documentation of the value of the Final Semester 1 Assessment was carried out to determine the level of

student learning outcomes. Both data were analyzed using SPSS software to determine the effect *self-efficacy* on mathematics learning outcomes. The categories of *Self Efficacy* levels and students' mathematics learning outcomes in Table 1.

Table 1. Self Efficacy Levels *Outcomes* Learning

Variable	Interval	Frequency	Precentage	Category
Self Efficacy	≥ 34,5	10	16,6 %	Very High
	28 – 34,5	35	58,3%	High
	21 – 27,5	12	20 %	Medium
	14 – 20,5	3	5%	Low
	≤ 13,5	0	0%	Very Low
	Total	**60**	**100%**	

Based on the table, it can be seen that the *self* of fifth grade elementary school students in Ayah District is in the high category with a percentage of 58.3%, while the level of Mathematics learning outcomes of fifth grade elementary school students in Ayah District is in the medium category with a percentage of 43.3%. Categorization Level *Self Efficacy* of Student showed in Table 2.

Table 2. Categorization Level *Self Efficacy* of Student

Variable	Interval	Frequency	Precentage	Category
Learning Outcomes	≥ 74,87	8	13,3%	Very High
	58, 97 – 74,87	12	20%	High
	42,07 – 57,97	26	43,3 %	Medium
	25,17 – 41,07 2	11	18,3%	Low
	≤ 24,17	3	5%	Very Low
	Total	**60**	**100%**	

In the next stage, the researcher tested the hypothesis with the test requirements, namely the stage of testing the coefficient of determination or R-Square, f-statistical test, and t-statistical test. The Average *Self-Efficacy* On Mathematics Learning Outcomes in Table 3.

Table 3. The Average *Self-Efficacy* On Mathematics Learning Outcomes

	N	Mean	Std. Deviation
Self Efficacy	60	100.93	6.908
Learning Outcomes	60	83.42	4.883

Table 3 explained that the average value of the *Self Efficacy* is 100.93 with a standard deviation of 6.908 and the average variable Hail learning mathematics is 83.42 with a standard deviation of 4.883. Based on data analysis found that the level of correlation or relationship (R) between two strong variables is 0.798 or 79.8%. Adjusted R square (r2) is a coefficient that shows the number 0.631, this means that *self-efficacy* as a variable x contributes 63.7% to variable y, namely mathematics learning outcomes, while the remaining 36.3% (100% - 63.7%) influenced by other factors that can affect the results of learning mathematics. The error of the Estimate is 2,966 (standard error of estimation), the smaller the standard error compared to the standard deviation will make the regression model more precise in predicting the dependent variable (10.710 < 11,312). Based on the results of the F-statistics test above, the value of Fcount > Ftable with the results of 101,889 > 3,128 was obtained and a value of significance of 0.000 < 0.05 was obtained. Thus, it was stated that *self-efficacy* had a significant influence on learning outcomes in mathematics. Results of T-Test showed in Table 4.

Tabel 4. Results of T-Test

	Unstandardized Coefficients		***Standardized Coefficients***		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	26.469	5.655		4.681	.000
Self Efficacy	.564	.056	.798	10.094	.000

Based on the results of the t-statistical test, *self-efficacy* a t-count value that is > t-table of 10,094 > 1,667 and has a significance value of 0.000 < 0.05. Thus, it is stated that the *self-efficacy* has a positive and partially significant effect on learning outcomes in mathematics. The beta coefficient of 0.564 states that each addition of 1 value in *self-efficacy* will increase the value of 0.564 in mathematics learning outcomes, if the value of x = 1 then = 60.

Discussion

Outcomes The results of the analysis stated that *self efficacy* had a positive and significant effect on learning outcomes in mathematics. *Self-efficacy* has a positive and partially significant effect on learning outcomes in mathematics. The social cognitive theory states that the belief in *Self Efficacy* influences a person's choice in carrying out actions and actions (Junedi et al., 2023; Schunk & DiBenedetto, 2020). Beliefs *Efficacy* can also determine the effort a person undertakes in an activity, the time when he is active in dealing with problems, and being able to persevere in dealing with various situations. This is inversely proportional to students who have *self-efficacy*, which is characterized by actions that quickly give up on every problem they face. Thus, it can be concluded that students who have *self-efficacy* will be successful in their learning activities and can complete each task well. *Self-efficacy* can improve student learning outcomes (Astuti & Pratama, 2020; Negara et al., 2021). This statement is also in line with research conducted (Demirtaş & Uygun-Eryurt, 2022; Gedeon & Valliere, 2018) with the results of research that *self-efficacy* can determine student learning outcomes. The main factors that affect learning achievement outcomes can be viewed from two things (Allen & Vallée-Tourangeau, 2016). First, internal factors from within students, namely physiological and psychological such as one's physical condition, talents, interests, motivation, and intelligence, etc. The second is external factors that originate outside the student, namely the surrounding environment, for example, infrastructure, teachers, family and administration. Data on field conditions show students who have *self-efficacy* will be successful in their learning activities and can carry out their academic tasks smoothly. This is inversely proportional to students who have *self-efficacy*, which is characterized by actions that quickly give up on every problem they face. Research that strengthens these results is research conducted by which partially states that the *self-efficacy* has a direct and significant effect on the learning outcome variable (Firdausiah & Etikariena, 2021; Sutrisno & Yusri, 2021). Based on the results of the descriptive analysis of *self-efficacy* after online learning, it shows that most students have *self* -efficacy in learning. Thus, it is hoped that schools will continue to improve the creative and interactive learning process in order to increase *self-efficacy* in learning. Thus, learning outcomes are a reflection of students' self-confidence. This is supported by research (Sunardi et al., 2019; A. Syafi'i et al., 2018) which suggests *self-efficacy* factors that play an important role in influencing the success of student learning outcomes.

Cultivating self-confidence in someone is very important so that you don't give up easily in facing all levels of difficulties that students will face, then have the stability or strength of belief that you are able to face all problems and of course master the material or all fields. to improve learning outcomes. Thus it is able to produce students who have high achievements in order to achieve the vision and mission (Anugrahana, 2020; Basith et al., 2020). In this study also found students who have *self-efficacy*. There are several impacts of online learning on students, namely; students become passive, less creative and productive; confuse students the accumulation of information/concepts on students is less useful; students experience stress; as well as improving students' language literacy skills. In line with previous research, the existence *self* -efficacy can be influenced by the obstacles experienced due to the impact of the online learning process such as students becoming stressed not only because of the learning process itself but also factors that affect the learning process (Stephen & Rockinson-Szapkiw, 2021; Zimmerman & Kulikowich, 2016). Based on the data from the results obtained, most students have high self-efficacy. According to the factors that influence a *self-efficacy* are external incentives, experiences of others, social support, the nature of the task at hand, and personal experience (Cepeda et al., 2021; Julaihi et al., 2022). When associated with this research, the personal experience of students according to Bandura's opinion is an important factor that results in *self-efficacy*. This shows that they have done online learning before at their respective schools so that they already have online learning experience there, already understand the online learning process, already understand in using online media so that they *self-efficacy*. With this learning experience, they already know how and what to do when they face obstacles or problems in learning even in this online learning process. With online learning, it has an impact on students in learning to be able to save time, create a learning community, be able to access learning materials with technological sophistication. This can also be used by students to form groups with friends they already know, discuss directly with teachers they already know through technology so that they have high confidence or *self* -efficacy in the online learning process (Demirtaş & Uygun-Eryurt, 2022; Faozen, 2019).

Pandemic apart from health, the economy that will be affected the most. With a low family economic status, which means that it may have a major impact due to the COVID-19 pandemic, parents' income has decreased (Browning et al., 2021; Ramadhani, 2020). As a result, parents have difficulty in paying for school and also the living expenses of their sons and daughters. This affects students so that students do not have a strong belief that they are able to pass this online learning process well because they also need money for the online learning process so that students are still found to have *self-efficacy*. Therefore, *self-efficacy* is not only embedded in outstanding students but must be embedded and instilled from an early age to all students in school. It is even considered necessary to instill in all elementary school students to further increase self-confidence. Keep in mind that *self-efficacy* or self-confidence will never appear unless we ourselves are willing to bring it up ourselves to continue to be a good personality in ourselves. Give yourself a chance to be able to bring up that self-confidence. Something we believe will definitely work and it all depends on the intention and belief itself. If our intentions or self-confidence are good, we will get good results. Individuals with self-efficacy will have high confidence in their ability to solve difficult math problems so that their learning outcomes increase, whereas individuals who have self-efficacy will have low confidence in their abilities to solve math problems they consider difficult and difficult. their learning outcomes are low. Teachers are expected to be able to facilitate students and add learning strategies to make it easier for students to achieve self-efficacy.

4. CONCLUSION

The findings partially have a positive and significant effect (self-efficacy) on students' (mathematics learning outcomes). Mathematics learning outcomes after the implementation of face-to-face learning are limited, one of which is caused by the low ability of students to understand mathematical concepts conveyed by teachers during online learning and difficulties in accessing the internet network, so that students often experience missing lessons. Students' mathematics learning outcomes will be more optimal if learning is done online in an attractive way and adapted to the conditions and characteristics of elementary school-age students. Teachers are expected to be able to motivate students so that they are aware of the importance of self-confidence to achieve good mathematics learning outcomes.

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