



The Effect of Self-Efficacy and Self-Regulated Learning on Ninth Graders' Mathematical Learning Achievement at MTS DDI Tarakan

Ilham^{1*}, Hamzah Upu², Bernard³

¹Postgraduate Program, Mathematics Education, Universitas Negeri Makassar

Email: ilhampiansyah@gmail.com

²Department of Mathematics, Universitas Negeri Makassar, Makassar, Indonesia

²Email: hamzah.upu@unm.ac.id

³Department of Mathematics, Universitas Negeri Makassar, Makassar, Indonesia

³Email: bernard@unm.ac.id

Abstract

This study aims to determine (1) the effect of self-efficacy on the students' mathematical achievement, (2) the effect of self-regulated learning on the student's mathematical achievement, (3) the effect of self-efficacy and self-regulated learning on the student's mathematical achievement of ninth graders' at MTs DDI Tarakan. The research used was quantitative research using survey methods. The sample of the study was 61 ninth graders at MTs DDI Tarakan. The data collection technique was distributing self-efficacy and self-regulation questionnaires and the student's mathematical achievement records. Results showed that there is a partially significant influence between self-efficacy and mathematical learning achievement, and self-regulated learning partly significantly affected the student's mathematical learning achievement. Furthermore, the research results indicated that self-efficacy and self-regulated learning contributed significantly to students' learning achievement. Moreover, the coefficient of determination demonstrated that self-efficacy and self-regulated learning contribute an effect of 15.1% simultaneously to students' mathematical achievement.

Keywords: *Self-efficacy; Self-regulated learning; Mathematical learning achievement.*

INTRODUCTION

In the Law of the Republic of Indonesia, Number 20 of 2003, Article 3 concerning the National Education System states that national education functions to develop capabilities and shape the character and civilization of a dignified nation in the context of educating the nation's life, aiming to develop the potential of students to become human beings of faith and piety. To God Almighty, noble character, healthy, knowledgeable, capable, creative, independent, and become a democratic and responsible citizen.

To achieve educational goals, important components must be considered in an educational process, namely, students, infrastructure, educational environment, and curriculum as teaching materials for students. Of course, if all these components are met, it will be very influential in determining the quality of education in a country. The quality of education is closely related to student achievement. According to Lase (2018: 2), learning achievement can be interpreted as the results obtained from learning activities in schools that are cognitive and are usually determined through measurement and assessment. Rosyid et al. (2019: 6) also states that learning achievement is generally related to knowledge. One of the learning achievements obtained by students is mathematics learning achievement. According to Alamsyah (2016: 157), Mathematics learning achievement is the learning result achieved by students after studying mathematics within a certain period and is measured using evaluation tools or tests.

Data obtained from the class ninth mathematics teacher at MTs DDI Tarakan shows that student achievement is low. This is evidenced by the value of the Mid Term Test (UTS) for math class ninth

odd term, from a total of 61 students, only 11 students whose scores are above the KKM. According to Syah (Gustina, 2020: 5), learning achievement is influenced by 3 factors, namely, external factors, internal factors, and learning approach factors. External factors come from outside the student, which can be in the form of environment, time, curriculum, and others. While internal factors are factors that come from within students and can be in the form of interests, motivations, student psychology, and others. Factors from within students are said to significantly affect student learning achievement because, from personal students, it is the beginning of all student activities starting to think, act and behave, causing student learning achievements to vary. One of the internal factors described by Bandura (Rulianti, 2014: 2) is that self-efficacy is an important factor that affects learning achievement.

According to Junizon (2018: 74), self-efficacy is an individual's belief in his ability to organize and carry out actions to achieve a goal where the individual is confident and able to face all challenges and can predict how much effort is needed to achieve that goal. According to Bandura (Dewi, Nuraini 2022: 153), Self-efficacy is an individual's belief in his ability to organize and complete a task to achieve certain results. Students' confidence in their ability to solve math problems will certainly provide good learning achievement than students who doubt their abilities (Putra et al. 2018: 52).

The results of observations show that students have a low level of self-efficacy. This can be seen when the learning process takes place, teachers often ask students to work on math problems on the blackboard, but they refuse because they do not dare or doubt the answers they have. In addition, when the teacher asked students' opinions regarding the material that had just been discussed, no one raised his hand to answer the questions given. Plus, many students think that mathematics is difficult to complete, so they tend not to try to work on the problems at hand. Such circumstances show that the lack of confidence in students' abilities to complete assignments makes them more dependent on others.

In addition to factors in students in the form of low self-confidence, other personal factors cause low learning achievement, namely self-regulation. According to Ghufroon (2017: 57), self-regulation or self-regulated learning is an individual's effort to manage or regulate himself to learn by involving his metacognition, motivation, and behavior. Self-regulated learning is the ability of students to self-regulate the steps in learning, be able to obtain their learning resources, and have their awareness to study or be independent (Nahdi, 2017 & Ranti et al., 2017). Students who have the ability to self-regulated learning are usually able to manage their learning process, have an organized learning strategy and time, and have clear learning objectives so that they will obtain optimal learning achievement. On the other hand, students who do not have self-regulated learning have less than optimal learning achievement.

Based on the class's ninth mathematics teacher, it shows that students do not have good learning readiness. This can be seen when facing a test; students do not prepare themselves to face the test. In addition, when the teacher has not arrived in class, students prefer to fill their time by playing rather than studying. Another fact is that students don't pay attention when the teacher explains the material and are just busy with themselves. In addition, the researcher concludes that when students are faced with learning mathematics, students complain more often and give up quickly learning it. Hence, students prefer seeing their friends' answers rather than trying to do it themselves. The phenomenon that occurs in these students shows that they still do not have the ability and skills to regulate themselves to learn well, where learning regulation is necessary for learning mathematics.

Based on the description above, researchers are interested in knowing the effect of Self Efficacy and Self Regulated Learning on Mathematics Learning Achievement of ninth-grade students at MTs DDI Tarakan."

METHOD

The type of research used in this research is quantitative research with a survey method. Samples were taken using the Nonprobability Sampling technique, namely saturated sampling. According to Sugiyono (2018:82), saturated sampling or census is a sampling technique in which all population

members are used as samples; this is often done when the population is relatively small. The number of samples in this study was 61 samples, namely all students of class ninth MTs DDI Tarakan.

In this study, the variables used were self-efficacy and self-regulated learning for the independent variable, while mathematics learning achievement was the dependent variable. The data collection technique in this research is to use instruments in the form of questionnaires and documentation. The questionnaire instrument was used to measure students' self-efficacy and self-regulation, while the value of student achievement was taken through documentation in the form of students' mid-term test scores in mathematics.

RESULT AND DISCUSSION

Result

Table 1. Descriptive Statistics of Research Data

Variable	Minimum Score	Maximum Score	Average	Standard Deviation
Self Efficacy	54	94	72,98	8,286
Self Regulated Learning	75	125	100,87	10,748
Mathematics Learning Achievements	38	76	60,85	8,843

Table 1. Shows descriptive statistics containing each variable's minimum score, maximum score, average, and standard deviation. Table 1 shows that the data ranges for self-efficacy, self-regulated learning, and learning achievement are 54-94, 75-125, and 38-76, respectively.

Table 2. Simple Linear Regression Results X_1

Variable	Dependent Variable (Y)		
	Regression Coefficient	t-count	Itself
Constant	32,771	3,443	0,001
Self Efficacy	0,385	2,969	0,004

Table 2 shows the regression equation to see self-efficacy's effect on learning achievement, commonly called the t-test. Based on the table, it can be seen that significant self-efficacy was obtained at 0.004, which is smaller than $\alpha = 5\%$, while at a t-count of 2.969, bigger than $t_{he\ t-table}$ of 2.002, it can be concluded that there is a partially significant effect between Self Efficacy on Mathematics Learning Achievement of ninth-grade students at MTs DDI Tarakan.

Table 3. Results of Simple Linear Regression X_2

Variable	Dependent Variable (Y)		
	Regression Coefficient	t-count	Itself
Constant	34,033	3,310	0,002

Self Regulated Learning	0,266	2,623	0,011
-------------------------	-------	-------	-------

Table 3 shows the regression equation to see the effect of self-regulated learning on learning achievement, commonly called the t-test. Based on the table, it can be seen that the significance of self-regulated learning is 0.011, which is smaller than $\alpha = 5\%$, while at a t_{count} of 2.623 bigger than $t_{\text{he t-table}}$ of 2.002, it can be concluded that there is a partially significant effect between Self Regulated Learning on Mathematics Learning Achievement of ninth-grade students at MTs DDI Tarakan.

Table 4. Results of Multiple Linear Regression

	Sum of Squares	Min	Squared Mean	F-count	Si
Regression	707,921	2	353,960	5,153	0,009
Residue	3983,751	58	68,685		
Total	4691,672	119			

Table 4 shows the multiple regression equation between self-efficacy and self-regulated learning on learning achievement, commonly called the F test. The F test results are obtained with a calculated 5.153 and a sig value of 0.009. Because the value of sig smaller than $\alpha = 5\%$, and $F_{\text{count}} = 5.153$ bigger than $F_{\text{table}} = 3.16$ So, it can be said that there is a significant simultaneous effect between Self Efficacy and Self Regulated Learning on mathematics learning achievement of ninth grade MTs DDI Tarakan

Table 5. Coefficient of Determination Test Results

R-value	Rated R ²	Standard Error Estimation
0,388	0,151	8,288

Table 5 shows the magnitude of the simultaneous influence between self-efficacy and self-regulated learning on learning achievement in mathematics. Based on the table, it is found that the value, so the coefficient of determination simultaneously, is 15.1%. This shows that the variables of self-efficacy and self-regulated learning can influence 15.1% of mathematics learning achievement.

Discussion

Based on the results of partial inferential statistical analysis that has been carried out for self-efficacy on the mathematics learning achievement of class ninth students at MTs DDI Tarakan, it can be concluded that there is a partially significant effect between Self Efficacy on Mathematics learning achievement of ninth-grade students at MTs DDI Tarakan. This situation shows that Self Efficacy consists of believing that you can complete easy and difficult tasks, having confidence in your abilities, increasing your best efforts, being able to face obstacles and difficulties, and responding to various conditions and situations in a good and positive way can encourage students to study well to obtain good learning achievement. However, if the students' self-efficacy is low, it will cause low learning achievement. This is reinforced based on facts in the field when research shows that many



students are not sure about making decisions, so they only follow friends; besides that, many students are hesitant about the results of their answers. This makes student achievement low because many students should get high scores but are unsure of their abilities and only follow friends' answers so that they get unsatisfactory scores.

Furthermore, based on the results of partially inferential statistical analysis that has been carried out for self-regulated Learning on the mathematics learning achievement of ninth-grade students at MTs DDI Tarakan, it can be concluded that there is a partially significant effect between self-regulated Learning on the mathematics learning achievement of ninth-grade students at MTs DDI Tarakan. This situation shows Self-Regulated Learning, which consists of the ability of students who can regulate their learning process, have learning strategies, organize study time, and have clear learning goals that can encourage students to obtain good learning achievements. On the other hand, students who are not able to manage their learning process, learning strategies and unorganized study time, and unclear learning objectives can make students obtain learning achievements that are not optimal. This is supported by findings in the field where students do not have good learning readiness, and when the teacher explains, students do not pay attention to the teacher's explanations and are just busy with themselves; when students are faced with learning mathematics, students complain more often and give up quickly which makes them prefer to see their friends' answers rather than trying to do it themselves. This results in students getting poor learning achievements.

Furthermore, based on the results of simultaneous or multiple inferential statistical analysis that has been done for self-efficacy and self-regulated learning on the mathematics learning achievement of class ninth students at MTs DDI Tarakan, it can be said that there is a significant effect simultaneously or together between self-efficacy and self-regulated learning on the mathematics learning achievement of class ninth students of MTs DDI Tarakan. With a sense of confidence in students' abilities to complete easy and difficult tasks, increase their best efforts, being able to face obstacles and difficulties, and respond to various conditions and situations in a good and positive way, coupled with the ability of students to implement learning strategies in the active and constructive process of students to set the goals of their learning process by involving metacognition, motivation, behavior in achieving their learning goals, the researchers concluded that students need self-efficacy and self-regulated learning to improve learning achievement in mathematics. This is also supported by previous research by Septian Handayani and Ni'matush Sholikah (2021) in their research entitled "The effect between self-efficacy and self-regulated learning on student learning achievement during online learning," Yowelma Tarumasely (2021) in her research entitled "The effect of self-regulated learning and self-efficacy on student academic achievement" and Rafika Meiliati, et al. (2018) in their research entitled "The effect of learning motivation, Self Efficacy and Self-Regulated Learning on Learning Outcomes Mathematics".

The results of testing the coefficient of determination show that the variables of self-efficacy and self-regulated learning contribute 15.1% to students' learning achievement in mathematics. In other words, 84.9% of students' mathematics learning achievement can be influenced by other variables outside the study.

CONCLUSIONS AND SUGGESTIONS

Conclusions

Based on the data obtained from the results of the analysis that has been carried out, the following conclusions can be drawn:

1. There is a partially significant effect between Self Efficacy on the mathematics learning achievement of ninth-grade students at MTs DDI Tarakan
2. There is a partially significant effect between Self Regulated Learning on the mathematics learning achievement of ninth-grade students at MTs DDI Tarakan
3. There is a significant simultaneous effect between Self Efficacy and Self Regulated Learning on the mathematics learning achievement of ninth-grade students at MTs DDI Tarakan by 15.1%. In other words, 84.9% of students' mathematics learning achievement can be influenced by other variables outside the study.

Suggestions

It is hoped that it can help to foster self-efficacy and self-regulated learning in students during the teaching and learning process of mathematics. In addition, concerning self-efficacy, it is expected that students can increase their confidence in their ability to complete the tasks given related to self-regulated learning. It is hoped that students can improve strategies in managing mathematics learning at home and school. Furthermore, to further strengthen research, it is necessary to conduct similar study with a wider population and sample so that it can increase the contribution given by self-efficacy and self-regulated learning to learning achievement in mathematics.

REFERENCES

- Alamsyah, N. (2016). Pengaruh konsep diri terhadap prestasi belajar matematika siswa sman 102 jakarta. *SAP (Susunan Artikel Pendidikan)*, 1(2). <http://dx.doi.org/10.30998/sap.v1i2.1022>
- Dewi, M. W. K., & Nuraeni, R. (2022). Kemampuan Komunikasi Matematis Siswa SMP ditinjau dari Self Efficacy pada Materi Perbandingan di Desa Karangpawitan. *Plusminus: Jurnal Pendidikan Matematika*, 2(1), 151-164. <https://doi.org/10.31980/plusminus.v2i1.1586>
- Ghufron, M.Nur. 2017. *Teori – Teori Psikologi*. Jakarta: Ar –Ruzz Media.
- Gustina, I., & Rahayu, W. D. (2020) Faktor – Faktor yang Mempengaruhi Prestasi Belajar Mahasiswa Jurusan Akuntansi Fakultas Ekonomi dan Bisnis Universitas Riau. *Jurnal Akuntansi dan Keuangan*, 9(2), 1 -11. <https://doi.org/10.32520/jak.v9i2.1361>
- Handayani, S. (2021). Pengaruh antara Self Efficacy dan Self Regulated Learning terhadap prestasi belajar mahasiswa selama pembelajaran daring. *Edukatif: Jurnal Ilmu Pendidikan*, 3(4), 1373-1382. <https://doi.org/10.31004/edukatif.v3i4.553>
- Junizon, M. (2018). Pengaruh Gaya Belajar, Kecerdasan Emosional, Self Efficacy dan Advertisy Quotient terhadap Kemampuan Pemahaman Matematis Siswa. *Jurnal Equation: Teori dan Penelitian Pendidikan Matematika*, 1(1), 65-80. <http://dx.doi.org/10.29300/equation.v1i1.1348>
- Lase, S. (2018). Hubungan antara motivasi dan kebiasaan belajar terhadap prestasi belajar matematika siswa smp. *Jurnal Warta Edisi*, 56, 1-829. <https://doi.org/10.46576/wdw.v0i56.15>



- Meiliati, R., Darwis, M., & Asdar, A. (2018). Pengaruh Motivasi Belajar, Self Efficacy, dan Self Regulated Learning Terhadap Hasil Belajar Matematika. *Issues in Mathematics Education (IMED)*, 2(1), 83-91. <https://doi.org/10.35580/imed9484>
- Nahdi, D. S. (2017). Self regulated learning sebagai karakter dalam pembelajaran matematika. *Jurnal THEOREMS (The Original Research of Mathematics)*, 2(1), 20-27.
- Putra, H. D., Putri, A., Lathifah, A. N., & Mustika, C. Z. (2018). Kemampuan Mengidentifikasi Kecukupan Data pada Masalah Matematika dan Self-Efficacy Siswa MTs. *JNPM (Jurnal Nasional Pendidikan Matematika)*, 2(1), 48-61. <http://dx.doi.org/10.33603/jnpm.v2i1.862>
- Ranti, M. G., Budiarti, I., & Trisna, B. N. (2017). Pengaruh kemandirian belajar (self regulated learning) terhadap hasil belajar mahasiswa pada mata kuliah struktur aljabar. *Math Didactic: Jurnal Pendidikan Matematika*, 3(1), 75-83.
- Rosyid, M. Z., Mustajab., & Abdullah, A. R. 2019. *Prestasi Belajar*. Malang: Literasi Nusantara
- Ruliyanti, B.D (2014). Pengaruh kemandirian belajar (self regulated learning) terhadap hasil belajar mahasiswa pada mata kuliah struktur aljabar. *Character; Jurnal Penelitian Psikologi*. 3(2)
- Sugiyono. 2018. *Metode Penelitian Pendidikan Kuantitatif*. Bandung: Alfabeta.
- Tarumasely, Y. (2021). Pengaruh Self Regulated Learning dan Self Efficacy terhadap Prestasi Akademik Mahasiswa. *Jurnal Pendidikan Edutama*, 8(1), 71-80.