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ANALYSIS OF STUDENTS' MATHEMATICAL SELF-REGULATED LEARNING DURING COVID-19 PANDEMIC

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ABSTRACT

At the beginning of 2020, the world was horrendous for the COVID-19 virus pandemic that paralyzed all activities including learning activities at school, which were changed into online learning from home. The purpose of this paper is to provide a description of students' self-regulated learning in Mathematics learning during the Covid-19 pandemic. The research subjects were junior high school students in North Sumatra. The research used qualitative research with descriptive research type. The method used was a survey method through a questionnaire. The research results indicate that students' self-regulated learning in Mathematics learning during the Covid-19 pandemic was in the sufficient category. It can be seen from the results of the questionnaire that students tend to be passive during online learning, tend to be one-way learning focus, which was only teachers to students, tend to work together in doing assignments, and the daily tests given to students look similar.

Keywords*: *self-regulated learning, online learning, covid-19 pandemic

ANALISIS *SELF -EGULATED LEARNING* MATEMATIKA SISWA DI MASA PANDEMI COVID-19

ABSTRAK

Pada awal tahun, dunia dihebohkan dengan adanya pandemi virus *covid 19* yang melumpuhkan segala aktivitas, termasuk aktivitas kegiatan pembelajaran di sekolah yang digantikan dengan pembelajaran online dari rumah. Tujuan tulisan ini adalah untuk memberikan deskripsi terkait *self-regulated learning* siswa dalam pembelajaran matematika di masa pandemi *covid 19*. Subjek penelitian adalah siswa SMP di salah satu sekolah di Sumatera Utara. Penelitian menggunakan penelitian kualitatif dengan jenis penelitian deskriptif. Adapun metode yang digunakan adalah metode survei melalui angket. Hasil dari penelitian menunjukkan bahwa *self-regulated learning* siswa pada pembelajaran matematika di masa pandemi *covid-19* berada pada kategori cukup. Dimana siswa cenderung pasif pada saat pembelajaran online, cenderung bersifat satu arah, yang mana hanya guru kepada siswa, siswa cenderung saling bekerja sama dalam mengerjakan tugas, dan ulangan harian yang diberikan kepada siswa terlihat serupa.

Kata Kunci: self-regulated learning, pembelajaran online, pandemi covid-19

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INTRODUCTION

Self-regulated learning is a learning activity that takes place on encouragement and self-will, self-choice and self-responsibility by students (Anzora, 2017). When students do not understand the discussion of the material, students tend to be active in understanding and learning it. Students tend to plan what will be learned, evaluate their learning outcomes, repeat, seek help and information from people who understand better (Zahary, 2015). Based on the results of the study, students who excel tend to have good self-regulated learning abilities (El-Adl & Alkharusi, 2020). The same thing also states that there is a positive influence between self-regulated learning and mathematics learning achievement (Winarso, Supriady, 2016). Other opinions also say that there is a direct positive effect of self-regulated learning on the ability to solve geometric problems (Ab, Margono & Rahayu, 2019).

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At the beginning of 2020, the world announced that there was a COVID-19 virus pandemic that paralyzed all activities. The rapid spread of the virus requires the government to stop all activities that gather in large numbers. Likewise with the learning process in class which must be stopped and replaced with an online learning process at home. This is in accordance with a circular letter regarding the implementation of compulsory learning from home (Kemendikbud, 2020). In the current situation of the Covid 19 pandemic, student self-regulated learning is very important in the process of learning mathematics. Self-regulated learning in online learning can be seen from the use of available time and learning resources by students, meaning that they are not too dependent on the material provided by the teacher. The existence of self-regulated learning in students, students will try to emphasize their own initiative to set goals in managing their learning process. As well as being able to assist students in directing their learning independence by arranging their study schedules, setting their learning targets and finding the information they need online (Khoerunnisa, Rohaetiyu & Ayu, 2021)

Other studies say that online learning cannot be carried out properly due to the lack of student self-regulated learning (Hidayat, Rohaya, Nadine & Ramadhan, 2020). Students' skills in learning mathematics online are also in a poor category (Efriyadi & Nurhanurawati, 2021). This means that there is an influence of students' self-regulated learning on online mathematics learning (Wahyuni & Harfad, 2020). Based on this explanation, this study aims to find out the description or description of students' self-regulated learning in mathematics learning during online learning.

LITERATURE REVIEW

Self-regulated learning is a combination of academic learning skills and self-control which makes learning easier, so that students are more motivated to learn (Glynn, Aultman & Owens, 2005). Self-regulated learning can help students get used to learning better and strengthen their own learning abilities, implement learning strategies to improve academic achievement, monitor their performance, and evaluate their own academic skills (Zumbrunn, Tadlock & Roberts, 2011). To support student self-regulated learning, there must be a learning platform that regulates student content and activities, or with other support through mentors or adults who help students learn directly (Carter, R.A, Rice, Yang & Jackson, 2020).

Self-regulated learning indicators include: 1) initiatives; 2) designing learning needs; 3) Goal setting; 4) determine the strategy; 5) perceive difficulties as challenges; 6) finding and utilizing needed learning resources; 7) controlling the process and evaluating learning outcomes and 8) the ability to self-regulate (Subekti & Jazuli, 2020). Other indicators state that indicators of self-regulated learning include: 1) not depending on other people, 2) self-confidence, 3) discipline, 4) responsible 5) behaving based on own initiative, and 6) exercising self-control (Hidayati and Listyani, 2010).

The implementation of learning in the period the Covid-19 pandemic is in reality not as maximal as when learning is carried out normally in class, especially in math lessons (Fauzy & Nurfauziah, 2021). Self-regulated learning has a positive impact on mathematics academic achievement or learning outcomes (Herlina, Juandi, Saputri & Anwar, 2022). Then, previous research also says that self regulated learning has a positive and significant influence between (self regulated Learning) on variables (learning achievement) in online learning in the time of covid 19 (Handayani, 2021). In contrast to some of the findings which say that students with high self-regulated learning categories have high and low communication skills (Sulastri & Sofyan, 2022). However, other research shows that independence in learning mathematics during the Covid-19 pandemic, which directly affects communication skills, is still in the low category (Efriyadi & Nurhanurawati, 2021).

REASERCH METHOD

The research method that wil be used in this research is qualitative research with descriptive research type. This research was conducted at one of the junior high schools in

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North Sumatra. The research subjects consisted of 28 Grade VIII junior high school students. The research instrument used was a non-test instrument in the form of a self-regulated learning questionnaire. The data collection techniques used were (1) non-test (self-regulated learning questionnaire); (2) interview, in this technique a series of questions are given orally to the subject related to students' self-regulated learning in mathematics learning at school. As for measuring students' self-regulated learning in mathematics learning, the questionnaire will be analyzed grouped into high, medium and low categories of self-regulated learning through Likert scale calculations. The scale used is a 4-point Likert scale, where each statement has 4 answer choices, namely "*Absolutely Agree (AA), Agree (A), Disagree (DA), Absolutely Disagree (ADA)*". These four choices are used to avoid ambiguous choices in the given statement. The instrument used in this study consisted of 4 indicators with each indicator having 1 positive statement and 1 negative statement.

Table.1 Score Guidelines for Self Regulated Learning Instrumen

Alternative Answers	Statement Score	
	Positive	Negative
AA (Absolutely Agree)	4	1
A (Agree)	3	2
DA (Absolutely Disagree)	2	3
ADA (Absolutely Disagree)	1	4

RESULTS AND DISCUSSION

The indicators used in this study are 1) Take the initiative to learn on your own, 2) Be able to overcome obstacles or problems, 3) Have self-confidence, and 4) Do things without the help of others (Sumarmo, Hendriana, Ahmad & Yuliani, 2019). Based on the results of the self-regulated learning questionnaire, the students obtained an average or mean (X) value of 30.17 and an SD of 3.73. So that the $X \geq 33.9$ interval is a high category of self-regulated learning, the $26.4 < X < 33.9$ interval is a medium self-regulated learning category and the $X \leq 26.4$ interval is a low self-regulated learning category. The following presents the criteria for self-regulated learning.

Table.2 Criteria of Self Regulated Learning

Self Regulated Learning Score	Category
$X \geq 33,9$	High
$26,4 < X < 33,9$	Medium
$X \leq 26,4$	Low

The results of the analysis of student self-regulated learning based on the analysis using the criteria in Table 2 are shown in Table 3 as follows:

Table.3 Results of Student Self Regulated Learning Questionnaire

Self Regulated Learning	Total
High	4
Medium	16
Low	8
Total	28

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Based on table 3, it can be seen that there are 4 students with high category of self-regulated learning, which means that students have a high desire to learn on their own, are very able to overcome obstacles in learning, have high self-confidence and are very capable of doing things without the help of others. Then, 14 students with self-regulated learning are in the medium category, meaning that students have sufficient desire to learn on their own, are sufficiently able to overcome obstacles in learning, have sufficient self-confidence and are sufficiently capable of doing something without the help of others. And 8 students with self-regulated learning are in the low category, meaning that students have a low desire to learn on their own, are less able to overcome obstacles to learning, lack self-confidence and are less able to do things without the help of others. The classification of the percentage of students' self-regulated learning uses the following categories:

Table 4. Percentage of Classification of Students' Self Regulated Learning

Percentage	Category
0% - 49%	very less
50-59%	less
60-69%	enough
70-89%	good
90-100%	very good

(Arikunto, 2006)

Based on the results of the self-regulated learning questionnaire filled in by 28 students, the following data were obtained:

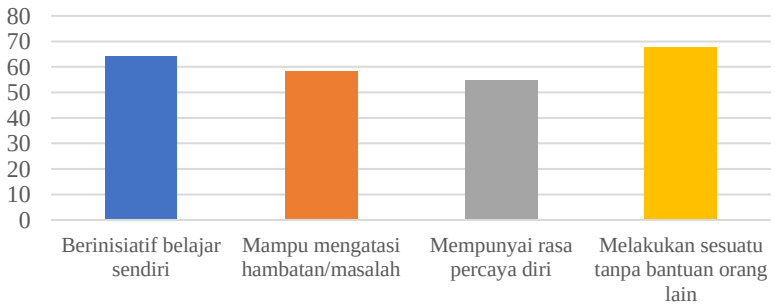

Figure. 1 Percentage of Self Regulated Learning Students for each indicator

Based on figure 1 it can be seen that of the four indicators of self regulated learning. In the first indicator, namely self-study initiative, as much as 64.2%, which means students are in the sufficient category. In this indicator, students try to find various sources other than textbooks. This can be seen from students trying to find additional information related to the material being studied, or material that is not understood. Students adapt to their preferred study mode in online learning (Calamlam, Ferran & Macabali, 2022). Where some students are looking for additional information related to material explanations via YouTube, from learning platforms such as the teacher's room, quipper, zenius, and the like which provide consulting services for learning materials and learning videos that have many choices on the internet. Having interesting

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learning videos will make it easier for students to understand learning material (Wijaya, Ying, & Suan, 2020). Then they summarize the material from watching the learning videos they are looking for. Then in the second indicator, namely being able to overcome obstacles or problems, it reaches 58.3%, which means students are in a category that is not good at overcoming obstacles or problems. Most students think that the teacher gives exercises that are a little difficult to learn mathematics will hinder their learning success, because these students tend to be unable to solve questions that are slightly difficult categories. Then students tend to avoid questions that are different from those that have been exemplified by the teacher during the explanation. Furthermore, in the third category, having self-confidence reaches 54.8%, it means that students are in a less good category in having self-confidence. Some students tend to be insecure and don't dare to ask the teacher about material they don't understand, students tend to be passive during online learning and tend to be one-way, namely only the teacher to students. This causes the teacher to have a little difficulty knowing what students already know (Wahyuningrum & Lathifah, 2020). Then there are still many students who copy their own friends' answers, because of their lack of confidence and doubt about their own answers. With this happening, it becomes difficult for teachers to know students who understand and students who do not understand. And in the fourth category, namely doing something without the help of others, it reaches 67.4%, meaning that students are in the sufficient category to do something on their own without the help of others. Students tend to be able to find additional information when they have difficulty understanding mathematics learning material, via the internet or other learning-support applications. But in doing assignments, students tend to cooperate with each other, this can be seen from the number of answers from the assignments and daily tests given to students that look similar. Which means that overall students' self-regulated learning is in the sufficient category.

Basically online learning is currently having a significant impact on student self-regulated learning, namely students are becoming more active in finding additional material because of the limited teacher space to deliver learning, as well as having a positive impact, namely the flexibility of student time in learning (Kusumaningrum, Budiarti, Triwiyanto & Utari, 2020). But there are also some obstacles from some students, namely constraints on the internet network which is still unstable, and not all students have sophisticated or Android mobile phones. This is also in line with previous studies which state that students with less stable economic backgrounds do not have the means to study online, so that student self-regulated learning tends to be low (Amelia, Kadarisma, Fitriani & Ahmadi, 2020). Behind the current constraints in online learning, of course, teachers are also trying to always be intensely involved with students so that they can influence student success in learning.

Based on the explanation above, it can be seen that the description of students' self-regulated learning in mathematics learning during the Covid 19 pandemic was in the low and sufficient category for each indicator. One of the reasons is that not all students, students and students are used to learning online (Purwanto, et al. 2020). Apart from that, plus many teachers are still not proficient in teaching using internet technology or social media, especially in various regions, this can be one of the reasons for low online learning. Students do not yet have a distance learning culture because so far the learning system has been carried out face-to-face, in Indonesia the use of e-learning is still relatively slow, in contrast to developed countries outside which have used e-learning at a more advanced stage (Hidayat, Rohaya , Nadine & Ramadhan, 2020).

Through online learning, teenagers can freely set their own learning strategies. This can be seen from the fact that some students use online learning platforms in Indonesia in their online learning process. However, in areas that do not have good internet network connectivity, online learning shows a different trend, areas that are not covered by the internet network must go to certain areas. (Firman & Rahman, 2020)

When they was doing assignments during the Covid 19 pandemic, students tended to copy their friends' answers. This makes it difficult for

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teachers to assess whether students have or have not understood the learning material provided. Learning independence needs to be instilled in students so they are able to learn and complete assignments and responsibilities (Zahro, Amalia & Sugito, 2021). With independence students are able to solve problems according to their own abilities (Sutama & Novitasari, 2018).

Then some students also feel that teachers who give difficult questions in learning will hinder their learning success. Students will stop working on a given math problem when it is felt that the problem cannot be solved alone, so students will prefer to study in groups. (Fitriana, Ihsan & Annas, 2015). Teachers can guide and show that making mistakes in solving a given problem is an important part of learning so that students do not avoid tasks that are challenging and require hard work. Help the student understand that the more difficult it is to get the correct answer, the more satisfying it will be when he finally completes it.

CONCLUSIONS AND RECOMMENDATION

Students' self-regulated learning during the Covid 19 pandemic in mathematics learning consisted of 4 students in the high category, 16 students in the medium category and 8 students in the low category. On the indicator of self-learning initiative and doing things without the help of others, it is in the sufficient category. The indicators are able to overcome obstacles or problems and have self-confidence in the unfavorable category. This can be seen from the fact that there are still students who think that the teacher giving them exercises that are a little difficult to learn mathematics will hinder their learning success, because these students tend to be unable to solve questions that are a little difficult. Then students tend to avoid questions that are different from those that have been exemplified by the teacher during the explanation. Not confident and not daring to ask the teacher about material that is not understood, students tend to be passive during online learning and tend to be one-way, that is, only the teacher to students and students tend to work together in doing assignments and daily tests given to students looks similar.

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