

**STUDENT ABILITY IN USING ALGEBRATOR SOFTWARE: CASE STUDY  
DURING ONLINE LEARNING**

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**Abstract**

*Online learning as an alternative that can be applied during the Covid-19 period. For the sake of smooth online learning, teachers need to make innovations so that the concepts of abstract mathematics learning are easily understood by students. One alternative is the use of technology as a learning medium to help solve mathematical problems using Algebrator software. This study aims to describe the ability of students to use Algebrator Software on number material as an alternative to online learning based on their mastery in using Algebrator. This research is qualitative descriptive research with a case study approach. The research subjects were 5 students from class VII who were randomly selected. The results of this study indicate that the ability of students to use Algebrator Software on number material as an alternative to online learning has been sufficiently mastered based on the results of the tests given and supported by the results of interviews. It is hoped that in the future students can improve their ability to master technology in mathematics learning.*

**Keywords:** *Algebrator, number, online learning, covid-19*

**INTRODUCTION**

The outbreak of *Coronavirus Diseases* (Covid-19) is still a major scourge that hinders all activities in various countries, one of which is Indonesia. The impact of Covid-19 has now penetrated the world of education, the government has begun to provide policies by eliminating all activities in all educational institutions to prevent efforts to transmit the virus (Hasibuan et al., 2021). Relevant to the circular from the Ministry of Education and Culture of the Republic of Indonesia No. 4 of 2020, that the learning process will be carried out remotely (online) and continue to contribute in the form of meaningful learning experiences for students (Dewi, 2020).

Online learning itself utilizes the internet network to assist interaction during the learning process. According to Syarifudin (2020) applying online learning is not only transferring lessons through internet media or just giving students tasks that must be done but in applying online learning it must be planned properly like studying in class.

Meanwhile, according to Mustofa et al., (2019) said that online learning is carried out remotely where teaching and learning activities are carried out separately. Based on the opinions above, it can be concluded that online learning is distance learning involving the internet network to connect it so that interactions in the learning process can be carried out properly when face to face.

Realizing the ideal online learning will certainly not be as smooth as expected, there will always be obstacles and obstacles faced by both teachers and students. Lessons that are quite difficult to do when learning online, one of which is mathematics, because mathematics itself is abstract where teachers still use the lecture method during learning so that students become passive and do not understand what they are learning and lead to a lack of motivation for students to learn mathematics. Istiqlal (2017) One of the basic materials in learning mathematics is the number material. Efforts that can be made by teachers so that students can understand this material are by using non-routine questions in the form of story questions related to daily problems. The purpose of giving these questions is so that students can think creatively to solve the problems given (Suripah & Sthephani, 2017). However, due to the current pandemic conditions forcing online learning, it makes it difficult for students to understand the questions given due to not being able to interact face-to-face between teachers and students during the learning process (Faznur et al., 2020). Based on this, teachers need to innovate and find appropriate learning alternatives to support the implementation of online learning.

One of the innovations that can be applied to support effective online learning is by utilizing technological advances as a learning medium (Novilanti & Suripah, 2021). Currently, the pace of development of science and technology is very rapid, this can be used as a changer of our perspective and way of thinking to be more practical and efficient in advancing the world of education (Suripah, 2017). Learning media is the right choice as a forum for applying technology to the learning process. The learning process by utilizing technology as a learning medium will be able to help interaction between teachers and students during the learning process because technology is quite complex, complete with multimedia and telecommunications in audio and visual form (Muthy & Pujiastuti, 2020). Thus, it can be said that the use of technology media itself will be able to help mathematics learning even though the learning process is carried out online.

One of the technologies that can be used as a medium in learning mathematics is *Algebrator*. *Algebrator* is software that is used to help solve problems related to algebra. Its use is also quite easy, all you have to do is type the question to be solved and then select *toolbars* the appropriate, it will help in solving the problem. *software* This is included in the CAS (*Computer Algebraic System*). In solving problems using *Algebrator*, students are not only given answers but will also be given clear and necessary steps to solve the problem to be solved (Umbara & Rahmawati, 2018). The results of the study of Kahiking et al., (2020) show that the use of *Algebrator software* can make students confident to solve problems with more enthusiasm and full concentration. This line with the opinion of Petrina (2019) that using *Algebrator Software* can improve students' critical thinking compared to not using it. Referring to some of the studies above, it can be seen that the use of *Algebrator Software* as an alternative during the learning process can improve learning outcomes, improve critical thinking, and create focus on students, but we also need to know how prepared students are in using the technology.

Seeing the use of learning media such as *Algebrators* themselves are indeed good in supporting online learning, but whether every student has been able to use the *software* properly so that they can solve problems related to arithmetic operations on numbers. Based on the description that has been disclosed, the researchers are interested in researching the ability of students to use *Algebrator software* on number material as an alternative to online learning. The ability of students is reviewed based on their mastery in using *Algebrator software* as a helper in solving problems to describe whether students can use technology well as a support in the learning process.

## **METHOD**

### **Types of Research**

This is a qualitative descriptive study using a case study approach. This study aims to describe the ability of students to use *Algebrator Software* on number material as an alternative to online learning because knowing the ability of students to use technology when online learning will be able to help facilitate the online learning process itself.

### **Time and Place of**

This research was carried out in the Odd Semester of the Academic Year 2020-2021 for class VII students in Junior High School Pekanbaru Riau. The researcher chose

this school because the researcher came from the area or region and knew enough about the conditions of education development in the area that would be the research goal

### **Research Subjects/Population and Samples**

The research subjects were class VII Junior High School students in Pekanbaru for the academic year 2020-2021 as 5 people were purposive random sampling selected and previously downloaded the *software. Algebrator*. Purposive random sampling is an assessment sample or an expert is a non-probability sample. The main purpose of purposive sampling is to produce a sample that can logically be considered representative of the population.

### **Procedure**

Taking research subjects, in this case, is adjusted to the research objective, namely to describe the ability of students to solve mathematical problems related to number material using *Algebrator software*. Furthermore, students were taken by purposive random sampling as many as 5 people to be given description questions in the form of story questions, why is that? This is because students with low, medium, and high mastery abilities are represented. So that these interests can measure all levels of students' abilities. In the next stage, students are directed to download the *Algebrator Software* as a learning medium. After students complete the questions given, the answers are analyzed by researchers and categorized based on predetermined criteria. As data supporting the results of written data analysis, researchers conducted interviews to obtain information that had not been described in written answers.

### **Data Analysis Techniques**

Analysis was carried out in this study by asking students to complete 5 test questions that were completed using *Algebrator software* and grouped into three categories, namely students mastering *Algebrator software*, students mastering *Algebrator software*, and students not mastering *Algebrator software*. Results from the answers of students are calculated using the following formula:

$$p = \frac{\Sigma s}{\Sigma \Delta s} \times 100\%$$

Description:

$p$  = Percentage ability of learners to use *Software Algebrator*

$\Sigma s$  = The number of questions answered correctly

$\Sigma \Delta s$  = Sum of all about the

Data obtained is then compared with existing categories in table 1 and analyzed descriptively to obtain conclusions about the ability of students to use *Algebrator software* on number material. As a supporter of the data obtained in writing, interviews were conducted to collect information that could support the students' mastery in using the *Algebrator Software* which was not depicted during the written test, then triangulated to see the compatibility between the results of the written test and the results of the interviews that had been conducted.

**Tabel 1**  
**Category of Student Ability**

Persentase	Kategori
$81\% \leq p \leq 100\%$	Mastering
$41\% \leq p \leq 80\%$	Moderately mastering
$0\% \leq p \leq 40\%$	Not mastering

Source: modification of Petrina et al., (2021)

## RESEARCH RESULTS AND DISCUSSION

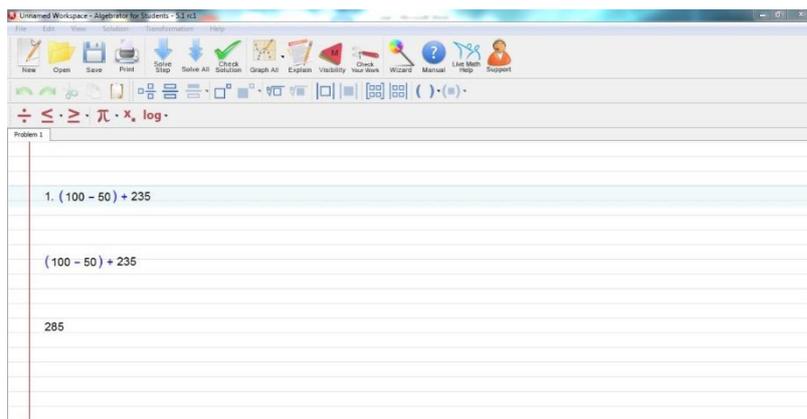
### Results Research

After being given a written test in the form of 5 questions that were completed using the *Algebrator Software*, the researchers grouped the answers that had been collected by the students and got the following data.

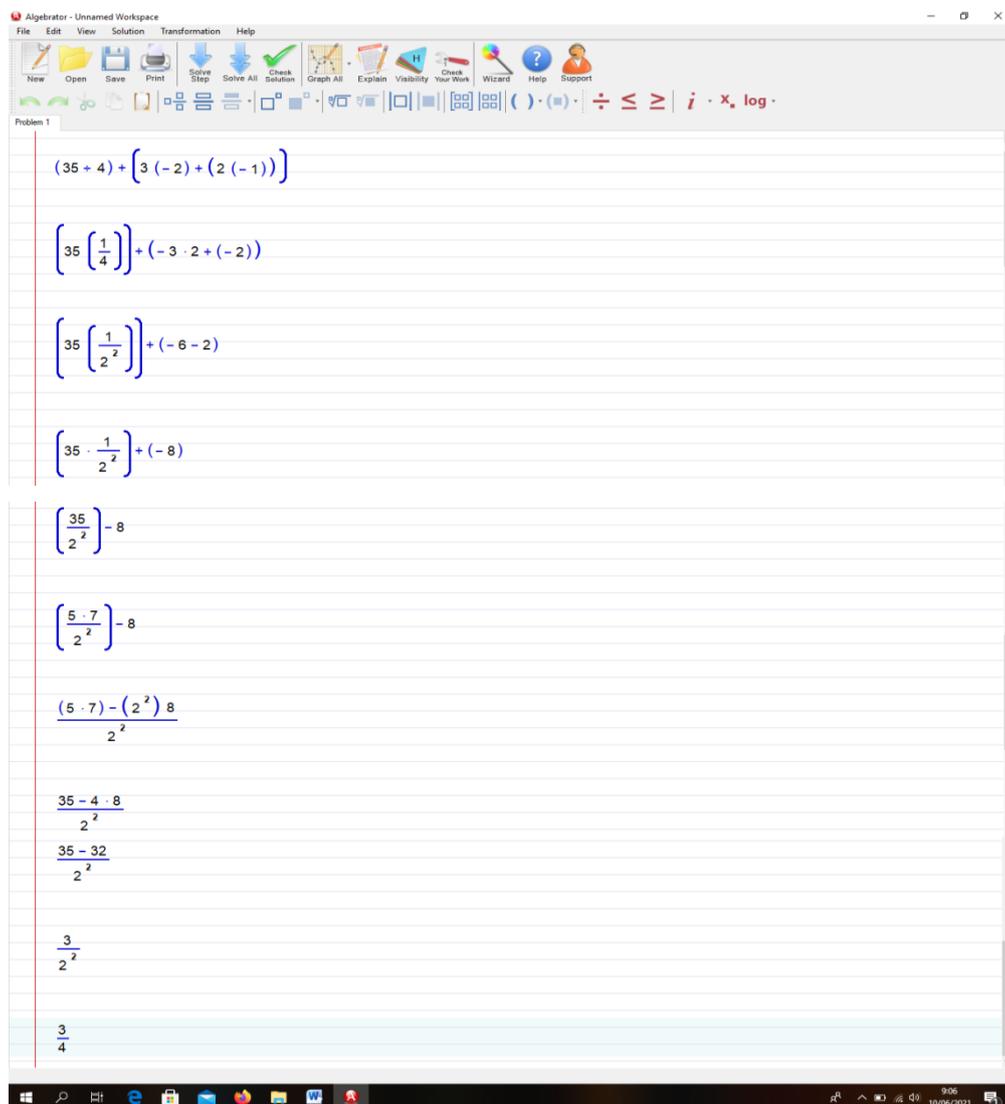
**Table 2**  
**Test Results of Students Using *Algebrator Software***

No	Subject	Percentage	Category
1	A	100%	Mastering
2	L	80%	Enough mastering
3	R	0%	Not mastering
4	I	60%	Enough mastering
5	E	100%	Mastering
Average Percentage		68%	Enough mastering

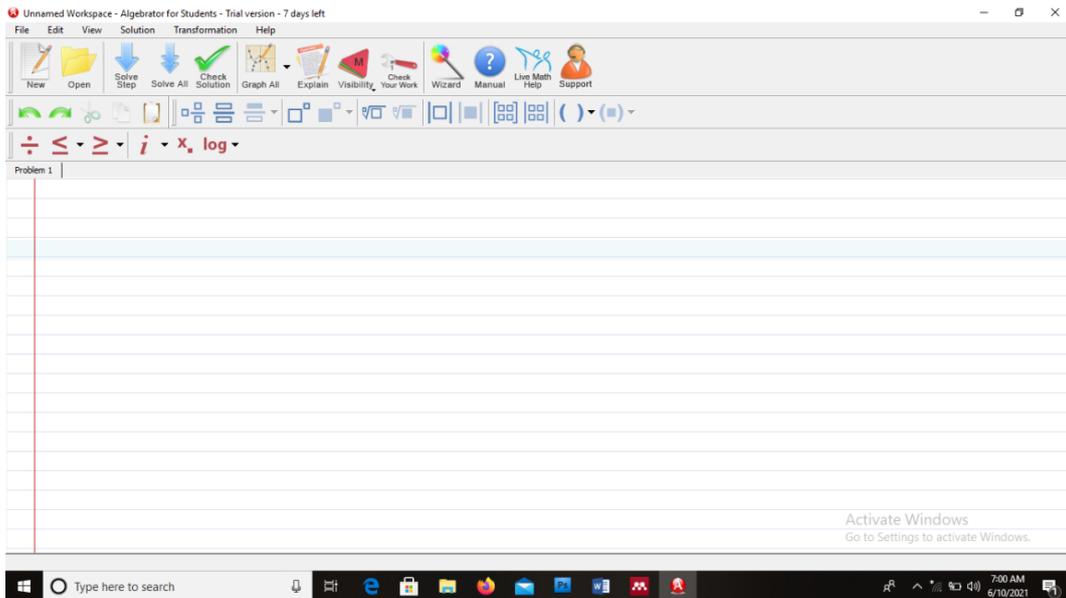
Results Descriptive analysis of students' abilities in using *Algebrator software* on number material as alternative online learning is presented in Figures 1, 2, and 3.



**Figure 1**  
Students' Answers in the Category of Mastering *Algebrator Software*



**Figure 2**  
Students' Answer in the category of only mastering the *Algebrator Software*



**Figure 3**  
**Students' Answer in the Category of Less Mastery of Algebrator Software**

Furthermore, the researcher also conducted interviews as supporting data. 3 questions will be interviewed in this study including have students used Algebrators before, the obstacles faced in using Algebrators when solving problems, impressions of using Algebrators as an alternative to online learning. The following are the results of interviews conducted on research subjects. Data is presented in Table 3 below.

**Table 3**  
**Data Interview Results**

Subjek	Data found
A	<ul style="list-style-type: none"> <li>• Learners have used the <i>Algebrator</i> before</li> <li>• Did not find any difficulties because its use has been mastered so that it is more helpful in the learning process on number material.</li> <li>• Mathematics learning becomes more fun on number material complete with problem-solving if solved using <i>Algebrator</i></li> </ul>
L	<ul style="list-style-type: none"> <li>• Learners have used <i>Algebrators</i> before.</li> <li>• Students can use <i>Algebrators</i> but are still not thorough in understanding the questions so they are still wrong in typing the arithmetic operations sign that will be used.</li> <li>• Using <i>Algebrator</i> can eliminate boredom when online learning takes place, especially in mathematics lessons.</li> </ul>
R	<ul style="list-style-type: none"> <li>• Never used <i>Algebrator</i> due to the teacher still teaching with the lecture method</li> <li>• Students cannot use the <i>Algebrator</i> and do not understand the toolbar</li> </ul>

	<p>functions in it and cannot complete answering the questions given</p> <ul style="list-style-type: none"> <li>• Students want to learn <i>Algebrator Software</i> so that in the future it can be the right alternative when online learning takes place.</li> </ul>
I	<ul style="list-style-type: none"> <li>• Learner know how to use <i>Algebrator</i> even though this is the first time trying it directly</li> <li>• Still stiff in using the existing toolbar and still often typing wrong numbers to be solved using the <i>Algebrator</i></li> <li>• Students expect the use of the <i>Algebrator</i> to be varied in other learning materials</li> </ul>
E	<ul style="list-style-type: none"> <li>• Students have used the <i>Algebrator</i> before</li> <li>• Students can solve all the questions given, be it addition, subtraction, multiplication, or division on whole numbers and fractions.</li> <li>• When online learning is supposed to use technology to attract students.</li> </ul>

## Discussion

Based on the data in Table 1, it can be seen that 2 students are in the mastering category, 2 more in the moderately mastered category, and 1 not mastering. The average percentage obtained from the test results of students when using *Algebrator Software* in solving arithmetic operations questions on number material is obtained by 68% or can be said to be quite mastered. The detailed discussion of each subject case is explained as follows.

Subjects A and E are students who have can master the category of using *Algebrator Software*. In Figure 1 it is shown that students have been able to understand test number 1 related to addition operations on integers. This can be seen in the two students who have been able to correctly enter the numbers that will be completed by the *algorithm* along with the operation sign to be used and enter parentheses first in the process so that the results obtained are correct without any *errors*. As reinforcement data based on interviews that the two subjects have used *Algebrator software* before. Especially on problems related to description questions related to everyday problems, students become familiar with mathematical problems. These results are confirmed from the results of previous research conducted by (Yulian, 2016), (Tamur et al., 2020) that-assisted learning *Algebrator software* can improve students' ability in solving mathematical problems.

Furthermore, subjects L and I are students who can use *Algebrator* in the moderately mastered category. As shown in Figure 2, these two students were able to master the *Algebrator software*, but due to their lack of accuracy in understanding the

description of arithmetic operations on numbers, they both made mistakes. The results of this written test are following the support from interviews that both students have actually used an Algebrator, but are still not skilled in operating it. The mistakes made were wrong when typing the arithmetic operation that should be used, for example, as was done by subject L in question number 2, he should have typed  $(35 \times 4) + (3(-2)) + (2(-1))$  but wrong by typing  $(35 4) + (3(-2)) + (2(-1))$  so that the results obtained are not correct. The results of this study are also supported by the results of previous research conducted by (Petrina et al., 2021) that knowing *software* is certainly not enough, but needs to be applied so as not to forget.

As for the subject, R is the student with the lowest ability because it is included in the category of not mastering *Algebrator Software*. As seen in Figure 3, students did not type anything on the existing worksheet. From the support of interview data, these students have never used an *Algebrator*. One of the reasons is, in the learning process, the lecture method still dominates learning. Guru still stuttering with the use of computer-based learning media or introduce the *software* course, as one of the effects is that students become less insightful and lack initiative. about the blank answers, of course, students do not understand *the tools* or commands that exist in the *Software*. The results of this study are justified by (Suratman et al., 2019) that the teacher's ability to master ICT methods and abilities affect the mindset of students in absorbing learning.

To support the results that have been obtained through the test, the researcher also conducted interviews as presented in Table 3. Based on the interview data in Table 3, the results of interviews conducted with students were obtained as supporting data from the previous test results, it was known that three students had used the *Algebrator* before. , one student is using it for the first time but has seen how it is used, and one student has never used it at all. Other information obtained is that for students who have used *Algebrators* as an alternative to learning, they can easily solve the given number operation problems starting from understanding the problem then inputting numbers to displaying the completion of the questions complete with the processing steps.

Some students also even though it was the first time using the *Algebrator Software*, it could be said that they had mastered it even though there were obstacles such as incorrectly entering numbers into the worksheet, incorrectly typing the arithmetic operations used so that the results obtained were wrong. Meanwhile, for students who have

never used the *Algebrator* at all, it is very difficult to understand how to use it so that they cannot solve the problems that have been given previously. This statement is supported by the research results of (Sihotang & Samuel, 2019) that the ability of students to master technology will have a positive influence on their future.

## CONCLUSION

Based on the results of tests and interviews conducted by students on the research subject, it was found that there 2 students who had the ability to mastering *Algebrator Software*, 2 more were in the category of ability to enough mastering *Algebrator Software* and 1 person with the ability not mastering *Algebrator Software*. In this study, it was found that the ability of students to use *Algebrator Software* on number material as an alternative to online learning had been sufficiently mastered based on the test results given and supported by the results of interviews.

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