



SCRATCH ANIMATION LEARNING MEDIA FOR FIRST MIDDLE STUDENT MATHEMATICS PROBLEM SOLVING

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ABSTRACT

Learning media is a tool used to convey lesson information to students. There are many learning media used to create a fun learning environment for students. The form of animated learning media can be used in solving math problems for students in junior high schools. One website or animation programmer site that students can use simply is Scratch. The use of the scratch application in learning mathematics with animated illustrations makes students excited in solving the problems presented. By using the quantitative method, this study aims to look at students' learning interest in solving math problems using scratch learning media. Subjects and participants involved in this study were children aged 12-15 years or the equivalent of junior high school education. The results showed that 80% of students were able to solve problems properly using animation media from the initial application. With a high number of results, it is hoped that it can provide a reference for teachers in choosing the right mathematics learning media for students.

Key words: learning media, scratch , problem solving, mathematics.

INTRODUCTION

Learning is a means of conveying knowledge to student (Fauzi, Budiharti, & Kawuri, 2019). In the opinion of (Pane, 2019), learning will form a process of asking questions and being asked about the reasons why phenomena can occur scientifically or based on knowledge. Therefore, to help the process of giving explanations about the causes of something happening, teachers usually need tools. Learning media is a tool that can be used to facilitate the delivery of knowledge. Learning media must be made in an attractive form in order to increase student learning interest (Magdalena, Shodikoh, & Pebrianti, 2021).

nowadays, students' problem solving abilities are still not optimal. Based on the results of the study (Kamil, Imami, & Abadi, 2021), there were 48% of students as research participants who had low-level problem-solving abilities, 36% in the high category, and 16% in the medium category. besides that (Sapriyah, 2019), stated that there were things that affected

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these conditions, one of which was because the average student could only fulfill the indicators in the pattern recognition section and only draw conclusions.

The ability to solve problems that are not systematic will lead to errors in students. (Hasan, 2015), the delivery of information that can result in non-maximum learning outcomes is the teacher who is unable to determine the right learning media and does not pay attention to the consequences of errors caused by students. Even though most students tend to keep these mistakes and do not dare to express opinions to the teacher (Yeni, 2015). (Amri, 2018) which explains that, some students who are confused in the process of receiving learning information are students who have a low level of self-confidence. Students who have a low level of self-confidence will tend to be lazy to ask questions (Amri, 2018). Delivery of information that is less than optimal from the teacher can be caused by the use of learning media that is simple and not in accordance with the current development of students.

There are still many teachers using simple learning media due to the teacher's lack of knowledge about learning media (Hasan, 2015). In this era of rapid technological development, there are currently many media programs that can be used in learning, such as using games and interactive videos. The application of technology in making learning media can make it easier for teachers in terms of presenting material (Nurrita, 2018). Apart from that there are several other advantages where learning media with the help of technology can be accessed by teachers and students through various electronic media such as computers or gadgets anytime and anywhere (Muhasim, 2017).

Mathematics is a branch of science that includes discussions related to the processing of numbers and values (Siagian, 2016). According to (Maharani, Nusantara, As'ari, & Qohar, 2020), mathematics is the core of other fields of science which includes training the mind in the form of representation, logic, and data manipulation. Mathematics hones reasoning and problem solving skills with the concept of determining solutions and creativity in looking for simpler steps (Novitasari, 2016). Mathematics is useful in carrying out daily activities (Siagian, 2016).

Scratch is a technology application platform that is used to create various media in the form of games, illustrated stories, calculators or simple calculators and others (Rozady & Koten, 2021). Scratch presents a programming language by combining various elements such as images, sounds, motion and calculations in one product (Nalbaho, 2019). Programming is presented simply with an attractive appearance, making it easier for beginners to try the program without fear of making mistakes (Satriana, Yusran, & Basrul, 2019). An attractive and interactive display of animated scribbles will facilitate the process of solving math problems.

MATERIAL AND METHODS

Sample of participant

The sample and participants in this study were 8th grade students at the junior high school level consisting of 45 female and 45 male students from three classes in the school. This school is located in Kuningan, West Java, Indonesia

Method of conducting research

This research method uses descriptive quantitative research methods. descriptive quantitative method is a research method using quantitative data collection and decomposition of the discussion descriptively. The quantitative method is a research method that is used by delaying definite data in the form of numbers that can be represented clearly (Sugioyo, 2016).

Measuring instruments

Measuring tools used in this study were tests, questionnaires, and check sheets. The questionnaire was used to see student's interest in using scratch learning media. while tests and check sheets are used to measure the problem-solving abilities of each student. The following is a detailed explanation of the research tools:

a) Questionnaire

The questionnaire in this study contained 15 questions consisting of 8 positive questions and 7 negative questions. The questions in the questionnaire contain indicators: interest, interest in learning, and preferences.

b) Test

The test in this study contains simple math questions arranged into stories. to solve these math problems students must be able to detail the existing problems and devise a solution strategy using scratch.

c) Check Sheet

Check sheets are used to assess each completion step used by students to get the correct answer for each test item.

Data processing methods

The data processing method used in this study uses the data triangulation process according to (Sugioyo, 2016). This triangulation method consists of the stages of data collection, data reduction and drawing conclusions.

1. Data Collection.

Data collection was carried out in several stages during the research process. This stage is to give tests to students, students are required to solve math problems that are in the test using scratch media. After completing the test, students are given a questionnaire to see student responses in solving problems using the application of scratch media.

2. Data reduction

Data reduction is done to sort out the data needed in research and data that is not needed in research. This is intended so that research is focused on the problem being studied.

3. Conclusion.

Conclusions were drawn by equating the data obtained from filling out tests and questionnaires that students had completed with check sheets. From the results of the data equation, it will show a conclusion in research activities as well as the factors that arise and influence the problems being studied.

RESULTS AND DISCUSSION

Based on the documentation of the results of problem solving related to the subject matter of flat sided shapes from 35 grade VIII students of SMP N 3 Cilimus using the interactive Scratch media. There were 9 themes of problem solving ability that appeared naturally seen from the fulfillment of indicators for each element.

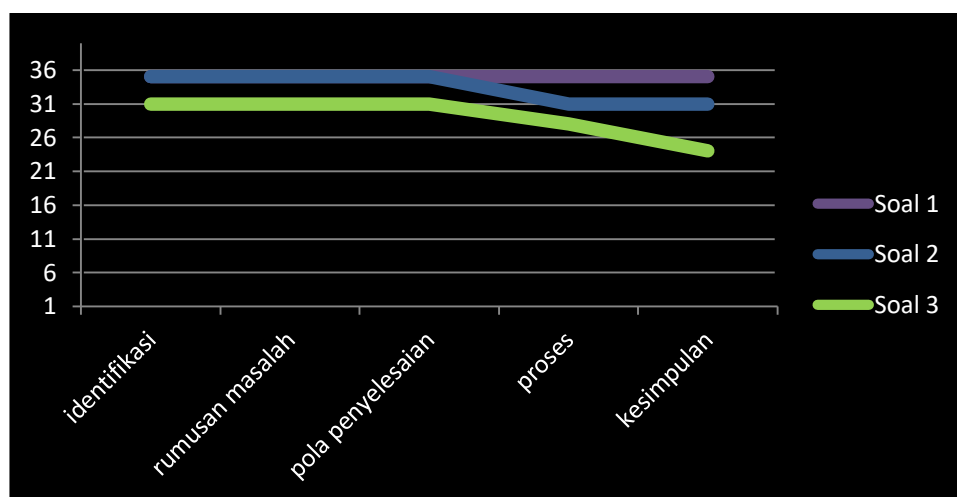


Figure 4. 1 Problem solving ability results

From the results of solving the problems that have been presented from the graphic data above, then the researcher interviewed 9 students who were taken from each theme that emerged as a subject that would represent all populations. The subjects were coded KS1, KS2, KS3, KS4, KS5, KS6, KS7, KS8, and KS9. The following is data on the fulfillment of problem solving elements that are owned by each category.

KS1 has the lowest level of problem solving both in fulfilling the elements of problem solving steps, namely identification, problem formulation, pattern of completion, process, and conclusion. Then KS2 has a higher level of problem solving elements than KS1. Furthermore, KS3 and KS4 have a higher level of problem solving than the previous category. In accordance with the level of problem solving abilities possessed by KS3 and KS4, it can be seen that KS4 has a higher level of problem solving than KS3,

Categories 5 to 9 can be seen that the ability to solve the problem is the same, namely showing the number 100 or perfect, this shows that categories 5 to 9 are able to read the data presented in the problem perfectly and determine the characteristics of the data, and the aims and objectives that exist in the problem with good and right. As for the level of problem-solving elements in the settlement pattern and also the process, it shows that category 5 has a lower level than categories 6,7,8 and 9.

Meanwhile, category 9 has the highest level of all categories. So it can be concluded that in the 9th category of problem solving students have fulfilled all the elements which are very good and correct. In other words, students are able to read the data presentation in the problem, determine the characteristics of the data, understand and know the desired meaning and purpose of the question, and determine the appropriate completion steps, then can determine the right answer to the problem.

In addition, in this category students are not only able to find answers to questions but also evaluate whether the problem solving process which then gets these solutions is correct or not.

CONCLUSION

Based on the results and discussion previously described, it can be concluded that problem solving through flat-sided geometrical questions using Scratch interactive media is diverse and can be categorized into nine themes according to indicators of achievement of problem-solving elements. Judging from the completion data of each student representing the nine themes, it can be seen that theme 1 is the theme with the lowest problem-solving category while theme 9 is the highest problem-solving ability category. In addition, the results of the study showed that 80% of students had very good problem solving abilities, 14% had medium category problem solving abilities, and 6% of students with low problem solving abilities.

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