STUDENT'S MATHEMATICAL PROBLEM SOLVING ABILITY IN THE HIGH CATEGORY ASSISTED WITH ANIMATION VIDEO MEDIA

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Abstract

This study aims to describe the ability of students to solve mathematical problems in the high category with the help of animated video media. This type of research is a qualitative descriptive research. The learning media used is Canva-based animated video media. The research subjects were class VII F students of SMP Negeri 3 Brebes Semester II for the 2022/2023 academic year. Taking the subject using random sampling from the test scores of written descriptions of mathematical problem solving ability. Data collection techniques in this study used tests, interviews, and documentation. According to Polya, the indicators of mathematical problem-solving ability are (1)understanding the problem (2)devising a plan (3)carrying out the plan, and (4)looking back. Based on the results of the study, it shown that: high mathematical problem-solving ability fulfills 4 indicators of mathematical problem-solving ability, there are (1)understanding the problem (2)devising a plan (3)carrying out the plan, and (4)looking back.

Keywords: problem solving, mathematics, video animation

1   INTRODUCTION

According to Fargil (2016: 258) in mathematics is one of the universal sciences that underlies the development of today's modern world (Fauziyah, et al, 2021: 155). The application of mathematics requires mathematical ability, one of the mathematical abilities is the ability to solve mathematical problems. If students have knowledge and skills in mathematical problem solving abilities, students will be more analytical in applying mathematics in everyday life.

According to Cooney, problem-solving abilities are very important, especially for students who are studying mathematics because they can help and improve mathematical abilities including analytical and critical thinking (Kurniawan, et al., 2019: 272). Polya (1973) states that there are four stages when using problem solving abilities, there are (1) understanding the problem, (2) devising a plan, (3) carrying out the plan, and (4)) looking back (Christina and Adirakasiwi, 2021:406). The mathematical problem-solving abilities of high-ability students tend to be able to use the conditions for each indicator of problem-solving ability correctly to solve all types of questions (Fatmawati and Murtafiah, 2018: 72).

Teachers as important role holders in the learning process should use methods and media in the learning process that can make students easily understand the material presented. To support the achievement of learning objectives, teachers can at least use tools or media in the learning process, especially in learning mathematics. In fact there are many media that can be used to assist the learning process, such as platforms/digital media that are easily accessible for all people, especially among students by utilizing the internet network, as well as information and communication technology (ICT). One of the learning media that can be used to assist the learning process is learning video media. Learning video is a medium that presents audio-visual content containing learning material that contains concepts, principles, procedures, theories and examples of knowledge in the hope that the audience from the video can understand the contents of the learning material. One of the instructional video media is animated video media. Animated video is a combination of moving audio-visual media. Visual video media relies on the senses of hearing and sight (Hapsari and Zulherman, 2021: 2385).

There are students who have problems solving math problems because in students' minds mathematics is a difficult subject. Where there is still confusion and difficulty from students in solving math problems. Students can solve the problem if the problem is not much different from the example problem or the type of question that only inserts numbers into the formula. Students experience

difficulties when faced with questions about the application of mathematics in everyday life, where students are not accustomed to writing down what is known in the questions, what is being asked, and drawing conclusions from questions regarding the application of mathematics given. This indicates the low ability of students' mathematical problem solving. The learning media used during class learning is still limited, such as teaching aids and there is no learning media in the form of learning video media.

The limitations of the problems studied are: (1) student's mathematical problem solving abilities based on the Polya stages, namely understanding the problem, preparing a solution plan, carrying out the settlement plan, and checking again, (2) the learning media used is Canva-based animated video media.

Based on the explanation, the purpose of this study is to explain the mathematical problem solving abilities of students in the high category assisted by animated video media.

1.1 Canva

Canva is an online graphic design application. The use of the Canva application in making learning animation videos that will be presented later will be more interesting so that it retains students' attention in participating in the learning process and better understands the material being taught.
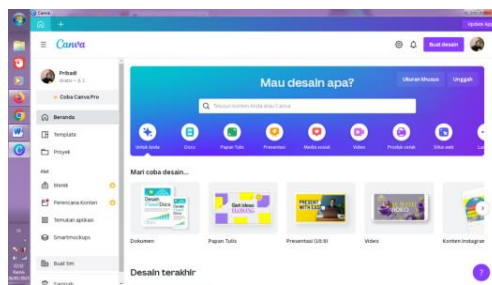
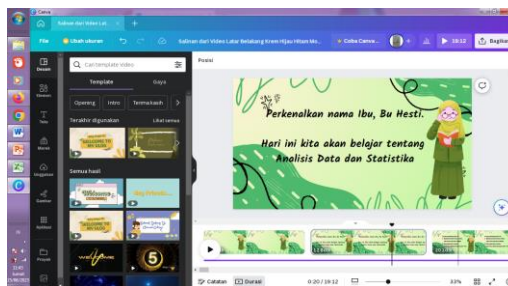

Figure 1. Screen Display of Canva

Figure 2. Display of Video Animasi Media

2 METHODOLOGY

The research was conducted to class VII F semester II of SMP Negeri 3 Brebes for the 2022/2023 academic year. In this research using descriptive qualitative research which aims to describe how the mathematical problem solving skills of students in the high category of class VII SMP Negeri 3 Brebes for the 2022/2023 academic year are assisted by animated video media on data analysis and statistics material based on Polya stages. Determination of the subject of this study by using random sampling. The subjects of this study consisted of 2 subjects with high mathematical problem solving abilities.

The form of the data in this study was a list of names of class VII F students at SMP Negeri 3 Brebes, test questions and student answer sheets related to mathematical problem solving ability tests, interview results, and documentation as well as several additional research supporting documents. While the collection techniques in this study include tests, interviews, and documentation. In this study, the presentation of the results of data analysis was in the form of descriptive analysis. Bogdan and Taylor (1975:5) define qualitative research as a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior (Moleong, 2015:4).

In this study, the presentation of the results of data analysis contained explanations related to the high category students' mathematical problem-solving abilities.

3   RESULTS

This study conducted to analyze the mathematical problem solving abilities of the high category students in class VII F semester II of SMP Negeri 3 Brebes for the academic year 2022/2023 on the material Data Analysis and Statistics assisted with video animation media. The results of the mathematical problem solving ability test will then be analyzed based on Polya's problem solving ability indicators which include understanding the problem (M_1), devising a plan (M_2), carrying out the plan (M_3), and looking back (M_4). The following is the achievement of the research subject's ability to solve mathematical problems:

Table 1. *Study Subject*

No.	Subject	Category	Subjek Code
1.	Inisial QDA	High	S-1
2.	Inisial SSA	High	S-4

Table 2. *Achivements*

Subject	Achivements																			
	No. 1				No. 2				No. 3				No. 4				No. 5			
	M_1	M_2	M_3	M_4	M_1	M_2	M_3	M_4	M_1	M_2	M_3	M_4	M_1	M_2	M_3	M_4	M_1	M_2	M_3	M_4
S-1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
S-4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	×	✓	✓	✓	✓

Table 3. *Result Achivements*

No.	Subject	Indicator			
		M_1	M_2	M_3	M_4
1.	S-1	✓	✓	✓	✓
2.	S-4	✓	✓	✓	✓

Based on the results of the analysis above, for students in the category of high mathematical problem solving ability it can be concluded that the S-1 subject fulfills all Polya's mathematical problem solving indicators there are understanding the problem (M_1), devising a plan (M_2), carrying out the plan (M_3), and looking back (M_4). Likewise, the S-4 subject fulfills all of Polya's mathematical problem solving indicators there are understanding the problem (M_1), devising a plan (M_2), carrying out the plan (M_3), and looking back (M_4).

4   CONCLUSIONS

4.1   Conclusions

Based on the results of the research, the results of the analysis of the mathematical problem solving abilities of students in the high category are assisted by video animation media as follows: students with high mathematical problem solving abilities fulfill 4 indicators of Polya's mathematical problem solving, there are understanding the problem (M_1), devising a plan(M_2), carrying out the plan (M_3), and looking back(M_4).

4.2   Advices

This research is expected to help and become a reference for conducting research on students' mathematical problem solving abilities assisted by animated video media. The use of animated video learning media can be used as a reference for conducting relevant research on learning media.

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