Learning Animation Videos with STEM Approach to Improve Students' Problem Solving Ability in Mathematics Subjects in Elementary School

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ARTICLE INFO	ABSTRACT
	This study aims to determine the effect of learning animation videos with the STEM approach to improve students' problem-solving skills in Mathematics in grade IV Elementary School. The data collection instrument in this study was the distribution of online questionnaires in the form of a google form link. The results of this study show that there is a relationship between the use of learning animation videos and students' problem-solving skills on fractions in mathematics in elementary schools. Based on the results of the person correlation test, it shows that there is an influence between the use of learning videos and problemsolving abilities, that is, the correlation result is 0.662. Problem solving ability of students is very necessary so that later students are active in learning activities. One method that can be applied is problem solving skills. opinions that he has and the teacher will assess the opinions of these students. Based on the findings, learning animation videos are suitable for schools with supporting facilities and infrastructure, for example schools that have LCD projectors, because to play learning animation videos, a device is needed and the use of learning animation videos requires teachers to be more creative in adapting animations to the material presented. will be served. Learning animation videos are also suitable for use in subjects such as Literature, Social Studies, Science, PKN, and others.

1. Introduction

Education plays an important role in one's life, without education we can later feel confused in doing something. Education is not only done formally, but education can also be done informally. The learning process provided in schools is very supportive in developing the potential for students. If the potential of students can be developed, then later students will be able to follow developments in the field of science and technology. The 2013 curriculum is the curriculum used by Indonesia today, this curriculum has a systematic, flexible, contextual nature and applies an adaptive and applied science system.

At the end of 2019 Indonesia experienced the Covid-19 Pandemic. The *Covid-19* pandemic that occurred resulted in restrictions, including one of them being restrictions on learning activities in schools. The existing Covid-19 pandemic made learning that was initially carried out face-to-face into learning that was carried out online or what was called online. This online learning process aims to reduce the spread of COVID-19. The COVID-19 pandemic has forced students to study online. In this online learning requires an approach using STEM. STEM stands for science, technology, engineering, and mathematics. STEM learning is a learning approach that is carried out in an integrated meta-discipline between science, technology, engineering, and mathematics. Children are required to interpret, relate, question, and find solutions to use their scientific information for the solution of problem cases (Bapoÿlu-dümenci & Muÿ, 2021). students need to collaborate and communicate with their peers to solve problems (Khamngoen & Srikoon, 2021) . By combining learning with STEM, students will be motivated to create new knowledge

and can improve students' problem solving abilities (Lestari, 2019). STEM learning can also be interpreted as integrated learning in an integrated manner in interdisciplinary science, technology, engineering, and mathematics that connects concepts in the world of work, the global world, and schools with the aim of students being able to compete in the new economic era. To apply problem solving methods Skills with a STEM approach require learning applications that can help the learning process run. Applications that can be used by teachers are using animated learning videos. Learning animation videos are one example of using technology to present learning material. By using learning animation videos, the learning material will be presented in an interesting way and not difficult for students to understand. Learning video can be interpreted as a technology that is able to carry out the process of capturing, recording, processing, storing, transferring, and constructing sequences of images that do not move by presenting images by moving electronically so that later videos can be seen as moving images (Batubara & Ariani, 2016). Learning video is a learning media that can later be used by teachers for students, learning videos are a learning media which can be seen by students using the sense of sight and heard by students using the sense of hearing (Hadi, 2017).

In Class IV there is fractional material in mathematics. Fractional material requires understanding of students' understanding and requires students' ability to analyze problems related to fractions. The learning process that will be carried out by students will not only understand related concepts but will train students to use the knowledge they have in real life. , students have good problem solving skills.

Problem solving is a goal, process, and basic ability. problem solving is said to be a goal, namely problem solving that will be applied later is the last target in mathematics material, in the sense that by studying mathematical material we can solve problems in learning more wisely, sequentially, not time consuming, and efficiently. Problem solving is defined as a process meaning that in problem solving there are steps that can be taken to solve problems or practice questions in mathematics more sequentially and accurately. *Problem solving* is defined as a basic ability or what is called basic is the basis that problem solvers must master, the problem here can be in the form of math problems or problems systematically, measurably and accurately (Suryani, 2019). *Problem solving* method is a learning method where in carrying out learning activities begins with giving cases first, after which the cases are solved both individually and in groups (Mardiana et al., 2017). Problem solving learning models have the advantage of getting students to make discoveries, think, behave creatively to solve problems realistically faced by students (Dayanur, 2020). The problem solving model is a model used to improve students' thinking skills so that students can think creatively and critically (Watipah, 2020). Problem solving is also defined as a way of presenting learning materials to make problems as a benchmark point of discussion to be analyzed so as to find answers (Usa & Pratiwi, 2021).

Based on the problems above, the author will conduct research at SDN 01 Dukuh Waluh with the title of research, namely the use of learning videos with a STEM approach to improve students' problemsolving skills in elementary schools.

2. Method

This research is a research with a quantitative approach which in practice in this study performs hypothesis testing, data collection, data analysis, and reports the results of data collection. Quantitative research is one of the types of research whose specifications are systematic, planned, and clearly structured from the beginning to the making of research designs (Siyoto, 2015). Quantitative research is research that uses numbers starting from data collection, interpreting data, and displaying research results (Andi Ibrahim, 2018).

This research is classified as correlation studies. Correlational or correlational research is a study to determine the degree of relationship between two or more variables without any attempt to influence these variables so that there is no variable manipulation (Siyoto, 2015) . The purpose of this study is to determine whether there is a relationship between the use of learning animation videos (X) and students' problem-solving abilities (Y) in mathematics in grade IV Elementary School.

This research was conducted in Class IV SDN 01 Dukuh Waluh. The data collection was done by giving a questionnaire to the students. The questionnaire given to the students contained 9 questions for the use of learning animation videos (X) and 4 questions for the problemsolving ability of Y students. The way of collecting data in this research is by giving questionnaires to students. Questionnaires are given to students aimed at knowing the abilities of students regarding the use of learning video applications to solve problems related to student problem solving. In analyzing the data that needs to be prepared, namely making research instruments, then the instrument after being applied to students is first tested for validity and reliability, this test is carried out so that later you can see the accuracy of the questions in the instrument, after that a

correlation test is carried out. Correlation test was carried out to determine the relationship between the x variable and the y variable.

This study uses a quantitative approach. The process of analyzing the data the researcher applies statistical analysis or statistical methods using SPSS 22.

1. Normality Test

   The basis for taking the Pearson validity test is the comparison of r count with r table.
   a. if the value of r count > r table = valid
   b. if the value of r count < r table = invalid

2. Hypothesis Test

   Correlation test was conducted to find out the relationship between variable X and variable Y.

   Correlation test aimed to determine the relationship between variable x and variable Y.
   a. Sig value < 0.05, then correlated
   b. Value of Sig. > 0.05, then there is no correlation

Data Analysis

Quantitative data analysis is done by making observations to see the learning process. In this study, the Likert scale technique was applied where the validation ranged from 1 to 4 which was carried out as a benchmark criterion.

Table 1. Likert scale

Respondent	Score
Strongly agree	4
Agree	3
Don't agree	2
Strongly Disagree	1

The dependent variable in this study is the use of STEM-based learning animation videos, while the independent variable is the student's problem-solving ability in mathematics. The basis for decision making *is the Pearson correlation test, which is* a significance value <0.05 then it is correlated, and vice versa if the significance value is > 0.05 then it is not correlated.

Table 2. Relationship Degree Guidelines

Pearson Correlation Nilai	Criteria
0.00 – 0.20	No correlation
0.21 – 0.40	Weak correlation
0.41 – 0.60	Medium correlation
0.61 – 0.80	Strong correlation
0.81 - 1.00	Perfect correlation

3. Result and Discussion

From the research that has been carried out to obtain data, a questionnaire was distributed to determine the validity, reliability, and correlation of the X and Y variables. The questionnaire was distributed using *personally administered questionnaires.* This technique aims for the questionnaire given to the respondent to return 100%, because the respondent immediately filled out the questionnaire when giving the questionnaire. After the data is collected, the next step is to test the correlation between the X variable and the Y variable. The correlation test is carried out using the SPSS version 22 application.

Table 3 . Correlation Test

		Use of Learning Videos	Problem solving skill
VAR00001	Pearson Correlation	1	.662 [**]
	Sig. (2-tailed)		,000
	N	30	30
VAR00003	Pearson Correlation	.662 [**]	1
	Sig. (2-tailed)	,000	
	N	30	30

[**]. Correlation is significant at the 0.01 level (2-tailed).

Based on the results of the calculations carried out, there is a Pearson Correlation value of the use of learning videos and students' problem solving abilities, namely 0.662, which means that according to table 2, it has a strong correlation. So it can be said that the use of learning videos with the STEM approach can improve students' problem solving abilities. The results of the correlation test between the use of learning animation videos and increasing students' problem solving abilities can be seen that the probability of 0.000 < 0.50 (significant level 5%) then Ho is rejected so that it can be concluded that there is a relationship between the use of STEM-based learning animation videos and students' problem solving abilities.

Media and learning models affect the success of students. From research conducted, the use of learning videos given to students makes students more interested in learning, because learning animation videos are packaged in an attractive form, not only that, the provision of learning videos to students is given in sequence so that students are not confused in following. learning process. The provision of learning videos given to students is also adjusted between writing and colors so that later students are not confused in participating in learning. The learning media is in the form of learning videos given to students using a *problem based learning model. Problem based learning* is a learning model by teaching which is done by familiarizing students to solve various problems to be solved independently or together (Suryani, 2019)

Based on the findings made by researchers, that the covid 19 pandemic that occurred at the end of 2019 caused learning to be carried out online and offline. These changes have an impact on education. One application that is used during online learning is the use of learning videos. The implementation of the use of learning videos with the youtube application in the learning process is by applying the *problem-based learning syntax. Problem based learning* applied to students will not only make students active in learning, but by using *problem based learning learning models* will help students in solving problems. In implementing *problem based learning* using the YouTube application, teachers need to design the learning process well, so that later the learning process will also run well.

In line with technological developments, the use of certain applications in learning is very useful so that students don't fall behind. The learning videos provided can be accessed repeatedly. According to (Faradita et al., 2022)states that the use of learning videos in science subjects makes lessons effective, even though there are several obstacles in the digital field, so it can be concluded that using animated learning videos is suitable used during the face-to-face learning process is limited.

4. Conclusion

Based on the results of the correlation carried out to determine the relationship between the use of STEM-based learning videos in improving students' problemsolving abilities, namely 0.662, it means that it has a strong correlation. With the use of learning videos in the learning process, it will make the learning process more fun, this is because the video display contained in the learning animation video makes students closer to everyday problems, not only that with the use of animated learning videos, understanding the concept is easier to understand. by students with direct practice compared to reading from a text.

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