

## **Systematic Literature Review: Utilization of Video Media in Math Learning**

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### **Abstract**

*Learning media plays an important role for teachers in carrying out learning activities in the classroom. Video-based learning media is one of the learning media that makes students able to understand the material presented by the teacher, because videos can show more real objects. Video-based learning media is also widely used by teachers because it has a good and successful influence on mathematics learning activities in the classroom. Making learning video media can use several applications such as powerpoint, videoscribe, canva, vegaspro, geogebra, powtoon, and others. The purpose of this study was to determine that video-based mathematics learning media has a positive effect on mathematics learning. This research is looking for several articles related to the use of video media in learning mathematics. The method used in this research is SLR (Systematic Literature Review). SLR is a technique of systematically collecting data, critically testing data, and collecting results that are in accordance with the topics used in the study. Research results from several accredited international and national journals show that the use of media in the form of learning videos in mathematics learning can help teachers and students in carrying out mathematics learning activities.*

**Keywords:** *slr, video media, mathematics learning*

### **INTRODUCTION**

Mathematics learning in Indonesia starts from elementary level to college level. Learning in the classroom certainly has problems that occur when teachers and students carry out learning activities such as learning mathematics. When students are able to complete math learning tasks given by the teacher in class, and are able to implement in daily activities, the purpose of learning mathematics has been achieved. The purpose of learning mathematics is to develop skills for life (Teoh et al., 2022)



The ideal teacher and as the center of learning should be able to make students motivated and have an active, creative, and innovative nature when learning in class. In addition, teachers should also always innovate in delivering mathematics learning with interesting teaching materials and mathematics learning media. This needs to be done when learning math in the classroom so that students do not get bored and bored quickly when following it (Suseno et al., 2020).

Teachers use learning media in delivering material during math learning activities in class with students. Learning media plays an important role for teachers to students in conveying messages and information. The use of learning media that is good and in accordance with the material being taught will affect the smooth running of learning. One of the learning media used by teachers during math learning activities in the classroom is video-based math learning media (Putri & Fitri, 2021).

Video-based learning media is media that makes students able to understand the material presented by the teacher, because videos can show objects that are more real. (Nurlinda et al., 2023). Video-based learning media is also widely used by teachers because it has a good influence and success in mathematics learning activities in the classroom. (Alfiani et al., 2023). The advantages of video-based learning media are that they are able to communicate, can present clearly, can be played back, and can be studied independently (Isnaini et al., 2023). Based on the description above, video-based mathematics learning media has a very positive effect on mathematics learning. Therefore, researchers are interested in conducting literature study research with Systematic Literature Review (SLR).

## **METHODS**

The method used in this research is SLR (Systematic Literature Review) which emphasizes the search stage. SLR is a technique of systematically collecting data, critically testing data, and collecting results that are in accordance with the topics used in the research. (Norlita et al., 2023). The stages of SLR are formulating problems / studies, identifying, filtering and feasibility of data, analyzing findings, and making conclusions. SLR research focuses on identifying, analyzing, evaluating, and explaining conclusions based on thorough research results. (Azis & Purniati, 2023). The use of the SLR method can help to review and identify journals in accordance with the specified procedures. (Wahyudin & Rahayu, 2020).

The researcher's step is to search and collect accredited international and national journal articles. The first step is to search through the publish or perish 8 application with a span of the last three years. After the search appeared, researchers collected data relevant to the research conducted, namely the use of video media in mathematics learning. After the data sought was collected, the researcher conducted an analysis for the research needed. The results of the research that have been found are then used in the main discussion. The time used in this research is from September to October 2023.

## RESULTS AND DISCUSSION

The data obtained from several journals that have been searched and analyzed, resulted in 12 national and international journals that will be used as research, as follows:

Table 1. Articles used in SLR

No	Author	Journal	Results
1	(Suseno et al., 2020)	Journal of Mathematics Education	The results of research with the subject of SMP N 3 Gorontalo students on multimedia-based interactive video learning media kite material after being tested and validated obtained a positive response of more than 70%. This shows that the interactive video learning media based on multimedia kite material is successful and feasible to use.
2	(Rasiman et al., 2020)	International Journal of Education and Practice	Based on the validation results of several development experts using the ADDIE model which consists of five stages, namely analysis, design, development, implementation and evaluation, learning videos on the material of the surface area of beams, cubes, prisms, and pyramids are learning media that are feasible as teaching materials. The assessment of several experts for the media is 95.15%, and the material is 90.86%. Learning videos on the surface area of blocks, cubes, prisms, and pyramids are one of the learning media that can be used in learning activities to foster interest and creativity.
3	(Putri & Fitri, 2021)	Jurnal Pendidikan Matematika Ekasakti	The results of the research are procedural learning video models on problem solving skills validated by mathematicians, the average 3.5 is in the very valid category. Based on the trial of video teaching materials conducted in terms of teachers with an average

No	Author	Journal	Results
			<p>of 3.9 in the very practical category and students with an average of 3.2 in the practical category. While the effectiveness of teaching materials in the form of videos with an average of 80 is in the high category. In conclusion, teaching materials in the form of videos are successful and effective.</p>
4	(Estapa & Amador, 2021)	Mathematics Education Research Journal	<p>A total of 45 articles that have been analyzed, 55% of specific clues were found. The results are: a) video is a useful media as a supporting tool in mathematics learning, b) attention to skills that can be developed, c) differences in the ability to pay attention between general teachers and special teachers. The articles from the general instructions showed the following: a) teachers experience differences in attention, b) teachers' attention changes, c) video selection is very influential for teachers. Video media is a useful tool in the implementation of learning activities in the classroom. In addition, making video media can also affect learning activities. Therefore, video media provides a strong experience and influence in helping teachers when implementing learning activities.</p>
5	(Huang et al., 2022)	Educational Studies in Mathematics	<p>This study discusses math teachers facing the challenges of online learning in the covid-19 pandemic era. This study randomly selected two teachers for two weeks during the pandemic. The data collected are learning videos, online learning, reflection on learning, and interviews with teachers who have conducted online learning. The results found that teachers use online learning videos as the main material in learning, in addition, cooperation between teachers supports them to develop online video lessons and overcome various problems. The existence of learning videos can help teachers in overcoming problems in mathematics learning.</p>
6	(Jin, 2022)	European Journal of Engineering Education	<p>Online video learning plays an important role during the covid-19 pandemic because face-to-face learning is not allowed. This research provides a solution for lecturers and first-year engineering students at NTNU (Norwegian University of Science and Technology) to adapt to higher-level math learning. The</p>

No	Author	Journal	Results
			purpose of this study is to see if the “TeachUs” method can help the learning activities. This study was conducted on students who did conventional learning and students who used the “TeachUs” method. As a result, students who used the “TeachUs” method responded positively and scored higher than students who did regular conventional learning. Therefore, the online video-based learning media “TeachUs” has a good effect and is very helpful in classroom learning activities.
7	(Nurlinda et al., 2023)	Jurnal Keguruan dan Ilmu Pendidikan	The research results from the use of learning video media effectively improve students' basic skills in whole number arithmetic operations. The test results showed a significant increase from cycle I 70% and cycle II increased 76.68%.
8	(Raharjo et al., 2023)	Jurnal Penelitian Universitas Kuningan	The research was conducted in class XI even semester of SMA Negeri 2 Pematang and two classes were taken as experimental classes, the first class, students with video media and the second class with e-book media. The results showed that students who were taught using video media obtained results of more than 55% with KKM above 70. This is higher than those taught using e-book media. Video learning media is effective in increasing students' interest and achievement in learning mathematics.
9	(Inganah et al., 2023)	Journal of Mathematics and Science Education	The results of his research are to overcome problems and provide skill solutions to teachers when learning in the classroom on the application of 6C. One of them with appropriate video-based learning media can help teachers and students to realize the learning objectives achieved. Learning with interesting video media can help students understand the material better than learning by only reading textbooks without visualization.
10	(Nadeak et al., 2023)	Journal of Social Science Research	The results of research from VII grade students at SMP Negeri 9 Pematangsiantar are based on the t test with the results of $t_{count} > t_{table}$ and the df used is 0,05 at $df = (n_1 + n_2 - 2)$ with $df = 58$ which is 2,002 then $4.531 > 2,002$ . Therefore, the use of learning video media affects students' mathematical creative thinking skills.

No	Author	Journal	Results
11	(Rokhmawati & Rahayu, 2023)	Journal of Authentic Research on Mathematics Education	The research was conducted at SMA Negeri 2 Banjar with 12 students of class XII.IPA. The results showed that geogebra-based learning video media can optimize students' mathematical concept understanding abilities on distance material in space. The success of the research apart from the teacher factor, namely the factor of students who feel enthusiastic and excited about learning with video models.
12	(Yusi & Merliza, 2023)	Journal of Mathematics Education	The results of the material expert validation questionnaire assessment on Powtoon-assisted learning media are included in the valid category with a percentage of 81.6. The assessment of media experts on Powtoon-assisted learning media is included in the "Very Valid" category with a percentage of 88.5. Meanwhile, the results of the practicality assessment based on the student questionnaire given to 10 MTs At-Thoyyibah Depok Rejo students obtained a percentage value of 92.6 with the category "Very Practical". Therefore, Powtoon-assisted learning media on SPLDV material is suitable to be used as a learning tool.

The use of learning media certainly affects the results of mathematics learning that will be carried out. As for some of the articles that have been analyzed, there are links to video-based learning media. The results of the research from the 12 journals are that the use of video media can help teachers and students in finding solutions to problems that occur in mathematics learning. The research (Suseno et al., 2020) using three stages, namely: defining (establishing and defining the requirements learning), planning (designing learning media based on the problems found in learning), and development (produce revised learning media products based on expert assessment and product trials.). These stages were developed with interactive video media for multimedia-based math learning on kite material. As a result, more than 70% of seventh grade students of SMP N3 Gorontalo gave positive responses. This shows that video-based learning media can improve student learning outcomes on kite material. In contrast to previous research, research conducted by (Rasiman et al., 2020) uses the ADDIE model which consists of five stages, namely: analysis (the researcher clarifies

the problems in learning and looks for solutions to solve these problems), design (this stage found solutions to learning problems and designed media in the form of videos which were then reviewed by experts for feasibility), development (this stage of the development of previous research), implementation and evaluation (the results of the analysis from the experts are then used to revise and evaluate the feasibility of the learning video). The difference from previous research is that additional stages of analysis, implementation, and evaluation are given. These stages are applied to learning videos on the surface area of blocks, cubes, prisms, and pyramids. After being tested and validated by media experts (95,15%) and material experts (90,86%), the learning video is a learning media that is suitable as teaching material and is able to foster interest and creativity in students. The ADDIE model has a positive influence on student learning outcomes.

When there is a learning problem that makes it impossible to carry out face-to-face meetings, such as during the covid-19 pandemic. Non-face-to-face learning is known as distance learning. It is conducted indirectly between teachers and learners by utilizing technology. An example of distance learning is using online-based video media. Online-based video media can help learning activities without face-to-face meetings. The existence of online video media helps teachers carry out learning as the main teaching material in delivering material. Research result (Huang et al., 2022) using online video media to help teachers conduct online learning. Online video-based learning is very helpful for teachers in delivering material. The same thing was done by (Jin, 2022) developing online video media “TeachUs” to make it easier for NTNU (Norwegian University of Science and Technology) lecturers and students to adapt to higher-level mathematics learning. The results of this study, online video-based learning media “TeachUs” helps in classroom learning activities.

Learning media such as video learning media makes it easier for teachers to convey learning materials. Making video media can be done by using applications such as geogebra and powtoon. Research conducted (Rokhmawati & Rahayu, 2023) uses the geogebra application as a learning video media on distance material in space. Geogebra is an application in mathematics learning that can help make visual mathematical concepts in geometry, calculus, and algebra materials. The research was conducted on 12 students of class XII IPA SMA Negeri 2 Banjar. The average score of students is

85.33 with a percentage of completeness of 83.33 far above the KKM. The same thing was done by (Yusi & Merliza, 2023) using the powtoon application in making learning video media for SPLDV material for class VIII MTs At-Thoyyibah Depok Rejo. Powtoon is a video-based online application with animation features. The results of the material expert validation questionnaire assessment on powtoon-assisted learning media are included in the "valid" category with a percentage of 81.6. The assessment of media experts on this powtoon-assisted learning media is included in the "Very Valid" category with a percentage of 88.5. While the results of the practicality assessment based on the learner questionnaire given to 10 students obtained a percentage value of 92.6 with the category "Very Practical". So that the learning media assisted by the powtoon application on SPLDV material is suitable to be used as a learning tool.

The disadvantages of learning video media include technical difficulties or connectivity constraints that can disrupt the learning process. Some students may have difficulty staying focused when watching videos, leading to a decrease in learning outcomes. The quality of video making may vary, and this can be a challenge for teachers to make videos that are suitable for the material being taught (Raharjo et al., 2023). In addition, the time used in making videos is sometimes an obstacle for teachers.

## **CONCLUSION**

Based on the explanation of the results and discussion of the research, it can be concluded that the use of media in the form of learning videos in learning mathematics can help teachers and students in carrying out mathematics learning activities. Hopefully, researchers and readers can apply the use of media in the form of videos in mathematics learning according to the material to be conveyed.

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