



Students' Interest and Critical Thinking: The Experimental Teaching Method in Using Online Learning Media YouTube

Anis Farida Jamil¹, Baiduri², Amelia Eka Pratiwi³



¹Mathematics Education Journal, University of Muhammadiyah Malang, Indonesia

²Mathematics Education Journal, University of Muhammadiyah Malang, Indonesia

³Mathematics Education Journal, University of Muhammadiyah Malang, Indonesia

e-mail: anisfarida@umm.ac.id (co-author)

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ABSTRAK

Dalam melaksanakan pembelajaran, pendidik harus kreatif sesuai dengan tuntutan teknologi dalam mengembangkan media pembelajaran. YouTube menjadi salah satu domain yang dimanfaatkan pendidik sebagai media pembelajaran online. Penelitian ini bertujuan untuk mengetahui pengaruh pemanfaatan YouTube sebagai media pembelajaran online terhadap minat belajar matematika dan berpikir kritis siswa. Subjek pada penelitian ini adalah 20 siswa sekolah menengah pertama. Penelitian ini menggunakan metode *Experimental Teaching* dengan pendekatan kuantitatif. Instrumen yang digunakan adalah angket dan soal tes yang diberikan secara online. Angket yang disebar pada subjek menggunakan google form dan soal tes diberikan setelah pembelajaran menggunakan media YouTube. Angket digunakan untuk mendapatkan data minat belajar matematika dan soal tes untuk mengukur berpikir kritis siswa. Analisis data menggunakan *paired sample test* dengan taraf signifikansi 0,05. Sebelum melakukan uji *paired sample test*, dilakukan uji normalitas dan homogenitas data. Hasil yang diperoleh data berdistribusi normal dan bersifat homogen. Hasil penelitian menunjukkan adanya pengaruh pemanfaatan media pembelajaran online YouTube terhadap minat belajar dan kemampuan berpikir kritis siswa. Hal tersebut ditunjukkan dengan nilai signifikansi untuk minat belajar sebesar 0,017 yang kurang dari 0,05 dan nilai signifikansi berpikir kritis 0,005 yang lebih kecil dari 0,05. Lebih lanjut nilai *N-Gain* dicari untuk mengetahui sejauh mana pengaruh media YouTube terhadap minat belajar dan berpikir kritis. Nilai *N-Gain* untuk minat belajar matematika siswa sebesar 0,12 dan berpikir kritis 0,28. Kedua nilai tersebut termasuk kategori rendah sehingga pengaruh media YouTube terhadap minat belajar dan berpikir kritis kurang efektif.

ABSTRACT

In carrying out learning, educators must be creative in accordance with the demands of technology in developing learning media. YouTube is one of the domains used by educators as an online learning medium. This study aims to determine the effect of using YouTube as an online learning media on students' interest in learning mathematics and critical thinking. The subjects in this study were 20 junior high school students. This study uses the *Experimental Teaching* method with a quantitative approach. The instruments used are questionnaires and test questions that are given online. Questionnaires were distributed on the subject using a google form and test questions were given after learning using YouTube media. Questionnaires were used to obtain data on interest in learning mathematics and test questions to measure students' critical thinking. Data analysis used *paired sample test* with a significant level of 0.05. Before carrying out the *paired sample test*, the normality and homogeneity of the data were tested. The results obtained data are normally distributed and homogeneous. The results showed that there was an effect of using YouTube online learning media on students' interest in learning and critical thinking skills. This is indicated by the significance value for learning interest of 0.017 which is less than 0.05 and the significance value of critical thinking 0.005 which is smaller than 0.05. Furthermore, the value of *N-Gain* is sought to determine the extent of the influence of YouTube media on interest in learning and critical thinking. The *N-Gain* value for students' interest in learning mathematics is 0.12 and critical thinking is 0.28. Both values are in the low category so that the influence of YouTube media on interest in learning and critical thinking is less effective.

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1. INTRODUCTION

In today's modern era, people are faced with the very rapid development of information technology (Arham, 2020; Samosir et al., 2018). The development of information technology that continues to grow is unstoppable and has an impact on improving the quality of education, especially in the learning process (Kendall

* Corresponding Author: Sutiman: anisfarida@unm.ac.id

et al., 2019; Myskova, 2019). Technology has shown many new features that can be utilized to make learning more interesting for students (Gnidovec et al., 2020; Tohari & Bachri, 2019). Utilization of information technology and network technology for improving the current learning system is online learning (Mustofa et al., 2019). Online learning is learning that using the internet, laptops, computers, and smartphones and it can be done remotely (Handarini & Wulandari, 2020). There are several learning options that can be done through online learning (Mila, 2018). One of them is online learning through the use of YouTube which is used as a media. Such a learning process will attract students because the delivery of material prepared in various forms of learning media can make students curious and stimulate interest in learning and students' thinking processes (Mustofa, 2019).

The most influential factor during teaching and learning activities is interest in learning (Andi, 2019; A. S. Anwar, 2020; Prayuga, 2019; Sirait, 2016). With the interest in learning, students can pay more attention to the learning process (Andi, 2019). Learning that requires a high enough interest in learning is mathematics learning (Otoo et al., 2018; Prayuga, 2019). Mathematics is a subject that is feared by students, so that students' interest in learning mathematics is reduced (Dewi, 2019). This results in poor student learning achievement (Prayuga, 2019). Interest in learning mathematics can be grown through the use of media in the learning process (Erna, 2018; Juitania, 2020). Learning media is a tool used by teachers and serves as a facilitator to provide subject matter to students during the learning process (Anwar et al., 2019; Subekti et al., 2017). The benefits of learning media in the teaching and learning process are that they can reduce the teacher's burden, generate new interests and desires, and generate motivation and stimulation of learning activities (Refo et al., 2018). So that the media can be used as well as possible, the teacher should understand the learning needs and problems faced by students related to the material to be taught. Thus, relevance, basic competence, material and media characteristics need to be developed (Karo & Rohani, 2018).

For students, the media can also be used as a bridge for critical thinking in addition to fostering interest in learning (Karo & Rohani, 2018; Sulthon et al., 2021). Critical thinking is an important mathematical ability in the Indonesian mathematics education unit level curriculum (Mulyanto et al., 2018). Critical thinking in students can be accustomed to using learning media that can arouse students to make arguments or just answer questions (Ngurahrai et al., 2019). So that the biggest role in improving the process and learning outcomes in learning is critical thinking (Razak, 2018). Technological changes in the field of education have resulted in extraordinary learning changes, especially for the use of media during the learning process (Sofyan, 2021). This brings the level of memory and critical thinking of students to the subject matter can be significantly increased (Cintang & Fajriyah, 2018). It is time now learning in the classroom is no longer using conventional methods. Technological developments should go hand in hand with a paradigm shift in education, especially in classroom learning (Arham, 2020). One example is the use of technology with the help of the YouTube platform as a learning medium. Through YouTube, which contains interactive, interesting, and fun learning videos, educators can display them (Mujiyanto, 2019).

YouTube is the largest and most popular online media sharing site on the internet (Arham, 2020; Samosir, 2018). YouTube allows educators to improve learning activities and focus more on understanding material quickly (Delfisanur, 2020). Learning videos on YouTube can be used by students or teachers in online or offline presentations, both inside and outside the classroom (Lasabuda, 2017). Currently, there are many interesting math learning videos on YouTube with a language style that is easier to understand (Lasabuda, 2017). One of the goals of learning media by utilizing YouTube is to create an interesting, fun and interactive learning atmosphere (Arham, 2020). YouTube also allows for distance learning and makes online learning easier especially in today's digital era (Samosir, 2018). YouTube is used as a learning medium because it is one of the media that is close to students' daily lives. YouTube as a learning medium is able to influence students' thinking skills such as critical thinking.

Many previous studies related to YouTube, including research Mujiyanto (2019) which uses YouTube as a teaching medium in increasing student motivation and interest, research Arham (2020) with the aim of research to explain the effectiveness of YouTube as a media, and Samosir (2018) which aims to determine the effectiveness of YouTube as a student learning media using descriptive qualitative methods. In addition, there is research related to interest in learning, such as research from Dewi (2019) which aims to determine interest in learning mathematics and describe learning mathematics with the help of the MS Power Point program, research Friantini & Winata (2019) aims to describe the learning interest of class XII students with qualitative methods, Safitri (2018) with the aim of knowing the use of audiovisual media that can increase student interest in learning by using classroom action research. The research related to critical thinking, among others, research zulhelmi & adlim (2017) researching the improvement of students' critical thinking skills through interactive media, research Husein, et al (2017) shows that the use of interactive multimedia can affect students' conceptual understanding and critical thinking skills, furthermore Pramuji et al. (2020) shows that critical thinking skills can be improved through STEM-based interactive multimedia.

Based on the explanations above, the research conducted previously only described how the benefits of using YouTube in learning were to attract interest in learning or its effectiveness as a learning media. But in this study, we want to find out more in general, whether there is an effect of learning media using YouTube on students'

interest in learning and critical thinking. In addition, this study also wants to find out more about the extent of its influence on students' interest in learning and critical thinking in learning mathematics. Therefore, this study aims to determine the effect of using YouTube as an online learning media on students' interest in learning mathematics and critical thinking.

2. METHOD

This research uses experimental teaching method. The approach used is quantitative because it uses numbers, starting from data collection, interpretation of the data, to the appearance of the results. This study was designed for single group to be given pre-test, treatment, and post-test. The pre-test and post-test values determine the success of a treatment. The research subjects were students of class VII-A MTs Al Muawanah Sidoarjo, totaling 20 students who were odd semester students in the 2021/2022 academic year.

This research consists of three stages, namely the preparation stage, the implementation stage and the data reporting stage. The preparatory stage consists of selecting videos from YouTube as a medium for online learning in accordance with the criteria and compiling research instruments in the form of a questionnaire on interest in learning mathematics, test sheets for critical thinking, and lesson plans. The implementation phase includes giving a critical thinking test, a questionnaire via google form for interest in learning mathematics, and giving a YouTube video. The data reporting stage is processing data in the form of a questionnaire on interest in learning mathematics and students' critical thinking answers.

Data collection was carried out by means of a questionnaire through google forms and tests. Questionnaires were given before learning and after learning to determine interest in learning mathematics through the use of YouTube videos, while the tests were in the form of pretest and posttest to determine students' critical thinking through the use of YouTube videos. So that, the instruments of this research are questionnaire and test. The data analysis used is the paired samples test using SPSS to determine the effect on the use of YouTube as an online learning medium. The first activity was to test the normality and homogeneity of the data. When the data is normal and homogeneous, then it is continued with the paired sample test and calculates the N-Gain value. The paired sample test was used to determine the effect of YouTube media on interest in learning mathematics and critical thinking with a significance level of 0.05. The results of N-Gain were classified into five categories, namely $G \geq 0.70$ High category, $0.30 \leq G < 0.70$ Medium, $0.00 < G < 0.30$ Low, $G = 0.00$ Increased, $-1.00 \leq G < 0.00$ Decrease.

3. RESULT AND DISCUSSION

Result

This research was conducted in the era of the covid-19 pandemic so that learning was carried out online. The place of research is MTs Al-Muawanah Sidoarjo with 20 students in class VII as the subject. The results of the study are explained in accordance with the research objectives, that is knowing the effect of using YouTube media on students' interest in learning mathematics and critical thinking. The study used a single-group pretest-posttest experimental teaching design. The following are the research data.

Interest in learning mathematics was obtained from the results of filling out a questionnaire via google form before the first meeting was held. Before carrying out learning through YouTube videos, the researchers shared a google form link containing a questionnaire on interest in learning mathematics. The questionnaire given was 15 statements. Based on the results of filling out an interest in learning questionnaire before learning, it can be concluded that 7 students received an interested category, 9 students received an interested enough category, and 4 students received a moderately interested category. After the students were given learning, to find out the students' interest in the end of mathematics learning using YouTube a questionnaire was filled out after. Post questionnaire being given as many as 15 statements. Based on the results of the questionnaire that has been carried out, it can be concluded that 2 students get a very interested category, 11 students get an interested category, and 7 students get an interested enough category.

Students' critical thinking seen from the results of student tests in mathematics before the implementation of learning using YouTube media. Before carrying out learning through YouTube videos, the researchers carried out a test to determine the critical thinking skills of class VII-A students at MTs Al-Muawanah Sidoarjo on integer material. The test is given at the first meeting with a total of 2 questions. Based on the results of the tests that have been carried out, that 3 students got high scores, 9 students got moderate scores, 4 students got low scores, and 4 students got very low scores. After the students were given learning, to determine the students' critical thinking skills, a posttest was conducted. The posttest is given in the form of 2 essay questions. After carrying out learning through YouTube videos, the researchers carried out a test to determine the students' critical thinking skills. Based on the results of the tests that have been carried out, it can be concluded that 6 students got very high scores, 1 student got high scores, 9 students got moderate scores, 2 students got low scores, and 2 students got very low scores.

The normality test used in this study is a statistical test using the Shapiro-Wilk test, because the amount of data is less than 50. This test is used to see if the data used is normal or not. Based on data analysis, the acquisition of the normality test of the questionnaire data before and after the questionnaire obtained significance 0.238 and 0.119 > 0.05 in each class so that the data used is normally distributed. After testing the normality of the data, then the homogeneity test was carried out. This homogeneity test is to determine whether there are differences in the data variance of interest in learning mathematics. Based on the results of the homogeneity test of the questionnaire data before and after shows significance 0.127 > 0.05. So the questionnaire data before and after this study had a homogeneous variant.

Based on data analysis, the significance value of the questionnaire before and after the questionnaire is 0.017. Then the significance value is less than 0.05. This shows that there is an influence on the use of YouTube on interest in learning mathematics. In this case the difference in the score of the questionnaire before and after the questionnaire is included in the low category, that is 0.12. This means that the value of N-gain has a low effect on learning through YouTube videos.

Table 1. Critical Thinking Normality Test

	CLASS	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
TEST RESULT	PRE TEST	.174	20	.113	.952	20	.399
	POST TEST	.154	20	.200*	.914	20	.077

Table 1 shows the normality test results for the pretest and posttest data obtained with a significance of 0.399 and 0.077 > 0.05 in each class so that the data used are normally distributed. The results of the homogeneity test of students' critical thinking in learning mathematics in Table 2.

Table 2. Test of Homogeneity of Critical Thinking

TEST RESULT		Levene	df1	df2	Sig.
		Statistics			
TEST RESULT	Based on Mean	.417	1	38	.522
	Based on Median	.410	1	38	.526
	Based on Median and with adjusted df	.410	1	37.254	.526
	Based on trimmed mean	.374	1	38	.544

Based on the results of the homogeneity test of the pre-test and post-test data in Table 2, it shows significance 0.522 > 0.05. So the pre-test and post-test data of this study have homogeneous variants of critical thinking data.

Table 3. Paired Samples Test Critical Thinking

Pair 1	PRE TEST - POST TEST	t	df	Sig. (2-tailed)
		-3.207	19	.005

Table 3 shows the significance value of the pretest and posttest of 0.005. Then the significance value 0.005 < 0.05. This shows that there is an influence on the use of YouTube on students' critical thinking. In this case, the difference between the pretest and posttest scores for critical thinking is included in the low category, that is 0.28. This means that the value of N-gain has a low effect on learning through YouTube videos.

Discussion

This study obtained result showing that using online learning media YouTube has an effect on the students' interest in learning mathematics. The results of the research of interest are the same as the results of research conducted by (Juitania, 2020; Mujiyanto, 2019; Refo et al., 2018) that the use of YouTube as a teaching media plays a significant role in interest in learning mathematics. This can be shown from the results of the paired samples test, which is H_0 rejected based on $\text{sig } 0.017 < 0.05$. This is in line with research, that is the use of youtube-based audiovisual media can increase student interest in learning (Pratama et al., 2020; Safitri, 2019). Other research found that the use of learning media can generate a desire or interest in learning (Andi, 2019). It can be seen in this study that the questionnaire before had the lowest score of 40 and the highest was 67 with an average of 53. While in the questionnaire after the lowest score was 47 and the highest was 74 with an average of 58.75. While the N-Gain data shows an increase of 0.12, so it can be concluded that there is an effect of using youtube on interest in learning mathematics. However, this study differs from other studies that learning with YouTube on interest in learning mathematics has a low effect. Changes in the value of the questionnaire before and after showed an increase in students' interest in learning mathematics after treatment.

This study obtained results showing that the utilizing of YouTube as an online learning media has an influence on students' critical thinking. This can be shown from the results of the paired samples test, which is H_0 rejected based on $\text{sig } 0.005 < 0.05$. Seen in the difference in the average posttest value is higher, that is 69.062 while the pretest value is only 56.875 with an N-gain of 0.28. The findings of this study found that the use of youtube has an average value of students' critical thinking being better than those who do not use YouTube as a learning media (Mufarroha, 2020; Soedarnadi & Sulisworo, 2021). Not only that, research showed an increase in students' critical thinking assisted by video and video can be used to enhance the professional learning of the mathematics teaching (Sofyan et al., 2021; Suh et al., 2020). The results show that YouTube social media-assisted learning can improve literacy skills and equip skills needed in the 21st century, namely critical thinking (Cintang & Fajriyah, 2018). Another positive influence can be seen from the change in the number of students who have better critical thinking skills than before.

4. CONCLUSION

From the results of the descriptive analysis that has been done, it shows that utilizing YouTube as online learning media has an effect on the students' interest in learning mathematics, also utilizing YouTube has an effect on the students' critical thinking. However this study show that the effect of online learning media YouTube is in low category on both student's interest and critical thinking.

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