
In Search of Quality Students: Animation Media to Improve Students' Critical Thinking Skills

SUSY SUARI^{1*} AND JUNAIIDI INDRAWADI²

Abstract

This research aimed to determine the effect of animated videos on the essential thinking skills of students at one junior public-school students in West Sumatera. It used a quantitative pre-experimental method using the one-group pretest and post-test design to determine the effect of animated video media. The results showed that animated videos could make students think critically based on the descriptive results. In addition, it was found that animated videos were effective for material on natural resources in Indonesia. It can be seen from the data normality test, which states that the data is usually distributed if $azymp > 0.05$. The t-test analysis results illustrate the effect of using animated video media on improving the critical thinking skills of one junior public-school students in West Sumatera. Thus, animated videos can improve students' critical thinking processes. Therefore, the application of animated videos in learning at school is good, valid, and effective because it can enhance students' critical thinking processes.

Keywords

Animation media, animated videos, critical thinking skills

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¹. Universitas Negeri Padang, Indonesia Corresponding author: susysuari24@guru.smp.belajar.id

². Universitas Negeri Padang, Indonesia

Introduction

In the era of Society 5.0, students will undoubtedly face various problems and are required to have the ability to think critically. With critical thinking skills, students can make the right decisions and solve multiple problems in life, school, and community problems. 21st century skills are skills needed to deal with changes and issues in the future in a society that has undergone many changes (Stukalo & Simakhova, 2020). Furthermore, these changes require the world to develop education as a tool that can foster students to master 21st century skills. These 21st century skills, including 4C (creativity, critical thinking, communication, and collaboration), are new skills that, if prepared correctly, will help prepare students to face the global era (Putry et al., 2020). One of the compulsory subjects in Junior High School (SMP) is social sciences. According to Alazmi (2022), the primary goal of social sciences is to educate students and equip them with the basic skills needed to develop according to their talents, interests, abilities, and environment. It also includes several provisions that enable students to continue their education to a higher level. The study of social sciences helps prepare students to participate in social life. Therefore, it is hoped that implementing IPS learning will be appropriate for achieving learning objectives.

Proper learning must pay attention to the learning process that will be practiced, so the methods used therein. The technique must invite students to play an active role, and the strategy must encourage student participation in the learning process so that learning is more meaningful and successful in meeting the social sciences learning objectives. Of course, teachers and students play an essential role in constructing the learning environment and its learning process. Learning experiences will be more relevant by utilizing various strategies to help students achieve better learning outcomes. Where the learning process is successful is determined by how the learning process takes place. Teachers must create a friendly, comfortable, and enjoyable learning environment (Harningsih, 2017).

From the students' previous experience, it becomes an asset for each student to achieve new knowledge or solve similar problems or problems that have just been encountered. The atmosphere of the tedious learning process can be seen in students' low cognitive learning outcomes. During the learning process, some students do not pay attention to the material provided by the teacher; for example, they often ask permission to go to the toilet, there is no discussion, they are sleepy, they tend to be passive, and students are less active in answering questions from the teacher and are not motivated in learning (Erpidawati & Putri, 2022; Ma'rifah & Mawardi, 2022).

Iswara and Juandi (2021) also found that the critical thinking skills of students at the junior high school level in Kediri were still in the low category. This is proven by the average score obtained in the students' critical thinking test, namely, with a score of 21.89 on a scale of 0-100. Other researchers also conducted research at the same school as the current researcher, relating to students' critical thinking skills, namely research by Mardarani and Apriyono (2023) and Ma'rifah and Mawardi (2022), which states that the critical thinking skills of students of SMP Negeri 10 Padang are classified as low. This is evidenced by the average percentage of category B (good), only 40.46%.

Based on the data and facts previously described, students' critical thinking skills are still low. Several factors that can affect students' critical thinking skills are internal factors and external factors. Internal factors can influence the level of thinking, activity, learning style, interest, talent, and motivation of students who are still lacking. In contrast, external factors are the role of the teacher. The role of the teacher who has not optimally influenced students' critical thinking skills can be caused by applying an inappropriate learning model. Teachers often apply the direct learning model (direct instruction) (Kusumawati et al., 2022).

Determining the learning models and methods used in the learning process must be done according to the curriculum objectives and to develop students' potential. A teacher's accuracy in choosing learning models and methods influences students' success. Teachers should use interesting learning methods but still provide space for students' creativity and critical and innovative thinking during teaching and learning. So that students' cognitive, affective, and psychomotor aspects can develop optimally (Syarhoh et al., 2022).

Some of the problems above encourage researchers to try to study social sciences learning problems. A learning model suitable for developing critical thinking is a problem-based learning model that can improve students' critical thinking skills in solving a problem and then combine them with video media—animation to increase the enthusiasm and motivation of students to learn. From social studies learning conducted at SMP Negeri 10 Padang, students' critical thinking skills still need improvement. Ideally, the learning process in schools should test students' prior knowledge because prior knowledge impacts the optimal development of critical skills. By providing essential exercises of thinking in social studies learning, students can use critical thinking skills to deal with the broader context of life.

Considering these challenges, it is crucial to explore innovative teaching methods that can effectively engage students and enhance their critical thinking skills. One promising approach is the integration of animated video media into the learning process. Animated videos can present complex information in a more accessible and engaging manner, making it easier for students to grasp key concepts and think critically about the material. This method aligns with the need for dynamic and interactive learning experiences that capture students' attention and stimulate their interest in the subject matter. Moreover, using animated videos can cater to diverse learning styles among students. By incorporating visual, auditory, and kinaesthetic elements, animated media can provide a multifaceted learning experience that appeals to a broader range of learners. This inclusivity is critical in a classroom where students possess varying prior knowledge and engagement. Thus, integrating animated videos into social studies lessons may foster a more inclusive learning environment that promotes collaboration and active participation.

Finally, various studies have supported the effectiveness of animated video media in enhancing critical thinking skills. Research has shown that students exposed to animated content demonstrate improved analytical skills, problem-solving abilities, and creativity. This highlights the potential for animated videos to engage students and develop essential skills needed for success in the 21st century. As education continues to evolve, educators must embrace innovative tools and strategies that can prepare students for the complexities of modern society.

Literature Review

Critical thinking skills are essential for students in the 21st century, as they enable individuals to analyze information, make informed decisions, and solve complex problems. Various studies highlight the importance of fostering these skills through innovative educational methods. Educational innovation is any innovation in education in the form of new ideas, tools, or methods aimed at achieving an academic goal or solving problems in the field of education (Romanovskiy et al., 2021). Meanwhile, Bekkers et al. (2011) stated that innovation is an idea, action, or something new in a particular social context to answer the problems faced. Education must adapt to the rapidly changing society by integrating creativity, communication, and collaboration skills into the curriculum. This demand has led educators to explore diverse pedagogical strategies that effectively engage students and promote critical thinking. One promising approach is the use of animated video media in the classroom. Animated videos can simplify complex concepts and present information in an engaging format that captures students' attention. Panjaitan et al. (2023) indicated that animated media can significantly enhance students' critical thinking skills, mainly in subjects like natural resources. By incorporating visual storytelling, teachers can provide a dynamic learning experience that caters to various learning styles, making it easier for students to grasp challenging material.

Moreover, the effectiveness of animated video media is supported by empirical evidence demonstrating improved learning outcomes. Hanif (2020) indicated that the developed animated video media has passed validation by experts and practitioners and has been proven practical for use in learning. The effectiveness test showed significantly increased students' critical thinking skills after using animated video media. This research found that animated video media is a valid, practical, and effective tool for improving elementary school students' critical thinking skills in science learning. This research provides an essential contribution to developing more interactive and engaging learning methods for students, with the potential to improve their understanding of subject matter and critical thinking skills. In conclusion, integrating animated video media in educational settings significantly advances teaching methodologies to improve students' critical thinking skills. As highlighted by the research, this innovative approach engages students and supports their cognitive development. With the increasing emphasis on 21st century skills, educators must adopt strategies that prepare students for future societal challenges and complexities. Continued research and application of animated media in various subjects can further illuminate its benefits and enhance educational practices.

Methodology

This research uses a quasi-experimental research type (quasi-experimental design). According to Shadish and Luellen (2012), a quasi-experiment is research that approaches an actual experiment. This research aims to directly test the effect of a variable on another variable and test the hypothesis of a cause-and-effect relationship. The quasi-experimental design has an experimental class and a control class. However, the control class cannot fully function to control external variables that affect the implementation of the experiment. This type of

research was quasi-experimental with a non-equivalent control group pretest-post-test design. According to Urbach (1985), an experiment is an experimental design carried out without randomization but involves assigning participants to a group. A quasi-experimental approach design was used as a group pretest-post-test design. With this design, two groups were not selected randomly. Two groups were given a pretest, and the last group was given a post-test.

Data collection procedure

The research respondents comprised 40 students from SMP Negeri 10 Padang. The respondents were selected because they were students who took the subjects studied. The sample was part of the total population, and the sample selection was done using a purposive sampling technique. This technique ensures that the sample taken has specific considerations so that the data obtained is more representative and relevant to the research objectives. In this research, 20 students from class VIII1 were designated the experimental class, while 20 students from class VIII2 functioned as the control class.

The data collection used a questionnaire to measure students' critical thinking skills. This questionnaire consists of questions designed to evaluate students' understanding before and after applying animation media. Before collecting data, the researcher asked permission from the principal and the teacher concerned to ensure that all parties involved understood the purpose of the research and agreed to participate. This way, the researcher can build a good relationship with the school and increase respondent involvement. After obtaining the necessary permissions, the researcher distributed the questionnaire to the respondents. In this process, the researcher explained to the students about the purpose of the research and the importance of their participation. The researcher also guarantees that the data obtained will be used only for research purposes and will not be disseminated without permission. This aims to maintain the privacy of respondents and avoid data misuse. By prioritizing transparency and honesty in the research process, it is expected to minimize the potential for bias and increase the validity of the research results. The quasi-experimental approach in this research focuses on methodological aspects and considers ethical responsibilities important in educational research. Thus, the research results are expected to contribute meaningfully to developing more effective and innovative teaching methods in academic environments.

Data analysis

Data analysis in this research was conducted descriptively and differentially to measure students' critical thinking skills before and after using animated video media. The pretest and post-test data in the experimental and control classes were processed using the Statistical Package for the Social Sciences (SPSS) software. Descriptive analysis provided an overview of student learning outcomes, including the average score and distribution of values from both groups. In this way, researchers can understand how much animated media influences students' critical thinking skills.

Normality tests were conducted to ensure the data collected were normally distributed, an essential assumption in parametric statistical analysis. In this research, normality tests can be performed using the Kolmogorov-Smirnov test. The results of this test will determine

whether the data from the pretest and post-test meet the criteria for normal distribution. In addition, a homogeneity test was conducted to assess the similarity of variance between the two groups using the Levene test. By ensuring that both groups have homogeneous variances, researchers can proceed to further analysis stages with confidence that the results are reliable.

After ensuring that the data meets the assumptions of normality and homogeneity, an independent t-test analysis was applied to test the research hypothesis. This test aims to determine whether there is a significant difference in improving critical thinking skills between students taught using animation media and students in the control group. The t-test results provide clear information about the effectiveness of using animation media in improving students' critical thinking skills. Suppose the significance value (p -value) of the t-test is less than 0.05. The alternative hypothesis is accepted, indicating that animation media significantly improves students' critical thinking skills.

Results and Discussion

Data description

This research was conducted at SMP Negeri 10 Padang. The research was carried out in class VIII1 SMP Negeri 10 Padang (an experimental class) with 20 students and class VIII2 SMP Negeri 10 Padang (a control class) with 20 students. This research aims to see the achievement of indicators in social studies learning by using animation media in the experimental class and conventional models in the control class. This measurement was carried out with a test of 20 multiple-choice questions and 10 questionnaire statements regarding animation media. Each class is given a pretest and a post-test.

Table 1. *Frequency distribution of data for pretest scores of control class students*

Value	Middle value	f	%
15-21	18	2	10
22-28	25	4	20
29-35	32	11	55
36-42	39	2	10
43-49	41	1	0.5
Sum		20	100

Table 2. *Frequency distribution of data for pretest scores of experimental class students*

Value	Middle value	F	%
25-31	28	3	15
32-38	35	3	15
39-45	42	11	55
46-52	49	2	10
53-59	56	1	0.5
Sum		20	100

The data above shows that there is an increase in students' critical thinking skills between the control class and the experimental class. However, the increase is not that significant. It

influences the increase of the essential thinking skills of junior high school students. The increase in the average value of the critical results in thinking of experimental class students increased by 37.45, namely from 40.25 to 77.7, which is different from the average value of learning results in the control class, which only increased by 35.35, namely from 30.6 to 65.95.

The data for the normality test is obtained from the research results and calculated. Using parametric statistics requires that each variable's data to be analyzed be normally distributed. The normality test is carried out to determine whether the data taken comes from a normally distributed population. 34 A data normality test is first carried out before conducting the hypothesis test. The normality test can be carried out using various techniques, one of which is the Kolmogorov-Smirnov, which is used if researchers want to know whether there are differences in objects, subjects, influences, and events. Normality testing is carried out with the following steps:

Table 3. *Normality test*

		<i>One-sample Kolmogorov-Smirnov test</i>			
		Control Class (Pretest)	Experimental Class (Post-test)	Experimental Class (Pretest)	Experimental Class (Post-test)
N		20	20	20	20
Normal	Mean	40.7500	78.2500	31.0000	66.2500
Parameters ^{a,b}	Std. Deviation	7.48244	8.77721	7.18185	7.58721
Most Extreme Differences	Absolute	.165	.129	.161	.185
	Positive	.135	.121	.139	.115
	Negative	.165	.129	.161	.185
Kolmogorov-Smirnov Z		.738	.577	.721	.825
Asymp. Sig. (2-tailed)		.648	.893	.676	.503

a. Test distribution is Normal.

b. Calculated from data.

The table above shows the results of the normality test using the Kolmogorov-Smirnov test for the four groups studied: the control class (pretest), the experimental class (pretest), and two experimental groups (post-test). From the results obtained, the Asymp. Sig. (2-tailed) value for all groups is more significant than 0.05. This indicates that the data from the four groups are normally distributed, which means that the normality assumption is met. In other words, no significant deviation from the normal distribution can affect further statistical analysis. This normality is essential to ensure the validity of the research results, especially when using parametric statistical methods such as the t-test.

Next, a homogeneity test is conducted to determine whether the group variations come from the same population. This homogeneity test uses the Levene test, a statistical method commonly used to test the equality of variance between groups. In this study, the Levene test provides information about the homogeneity of variance, which is essential to ensure that comparisons between the experimental and control groups can be carried out validly. If the homogeneity of variance is maintained, the results of the subsequent t-test will be more reliable.

Homogeneity can be calculated by comparing the variances of the tested groups. If the highest and lowest variances have a ratio that does not exceed a specific limit, then it can be

concluded that the groups are homogeneous. In the context of this study, the steps for calculating homogeneity are expected to provide a clear picture of the similarities in characteristics between the experimental and control groups. By ensuring that both groups have homogeneous variances, researchers can continue further analysis with confidence that the results reflect significant differences between the treatments.

Table 4. *Test of homogeneity of variances*

Critical Thinking Skills				
Levene Statistic	df1	df2	Sig.	
.461	1	38	.501	

The table above illustrates that the Levene statistic value is .461 with a significance (Sig.) value of .501. Since the Sig. value is greater than 0.05, it indicates that there is no significant difference in the variances between the experimental and control groups. This result confirms that the samples can be considered homogeneous regarding their critical thinking skills. Homogeneity of variances is an essential assumption for further parametric tests, such as the t-test. By meeting this assumption, we can ensure that the results of the hypothesis tests are reliable and valid, thereby strengthening the conclusions drawn from the research findings.

Hypothesis test

The hypothesis of this research is to determine the effect of using animated video media on increasing students' critical thinking skills in social studies subjects at SMP Negeri 10 Padang, which can be seen in the table below:

Table 5. *T-test (Independent samples test)*

	Levene's Test for Equality of Variances		t-test for Equality of Means							
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
Critical thinking skills	Equal variances assumed	0.461	0.501	4.626	38	0.000	12.00000	2.59428	-17.25184	-6.74816
	Equal variances not assumed			4.626	37.221	0.000	12.00000	2.59428	-17.25545	-6.74455

The test results above describe the testing results using t-test data obtained by a sig value <0.05, meaning that animated media influences increasing students' critical thinking skills in social studies learning at SMP Negeri 10 Padang. Based on the data processing results, this

research is quasi-experimental research, where samples are taken from two classes, namely class VIII1 with 20 students as the experiment class and class VIII2 with 20 students as the control class. This research aims to discover the increase in students' critical thinking skills with animation media applications in social studies learning. Based on the results of data processing that was carried out using the t-test statistic, it was obtained that count = 4.62 with $dk = 38$ at a significant level of 95% or 0.05. From the t distribution table, $t(0.95)(38) = 1.68$ is obtained, whereas the calculated table test is $4.62 > 1.68$. So, it shows that hypothesis H_0 is rejected, and hypothesis H_a is accepted. The results of the data analysis above can be concluded that the use of animation media is very effective in improving students' critical thinking skills in social studies learning. Increasing students' critical thinking skills is a positive thing, as it improves students' understanding of the concepts taught by teachers. This can also improve learning outcomes in social studies lessons.

The results of this research align with research conducted by [Kusumawati et al. \(2022\)](#) that learning using animated video media can improve students' critical thinking skills in the upper, middle, and lower groups in natural resource material. The level of improvement in students' critical thinking skills is different, as can be seen from the increase in the upper group; the increase is in the high category, the middle group is in the medium category, and the lower group is in the medium category ([Lestari, 2022](#); [Syarhoh et al., 2022](#)). Based on the research and discussion results, it was concluded that students taught using animated video media had higher learning outcomes than those taught using torso and image media. Furthermore, students who have high initial knowledge and are taught with animation, torso, and image media have higher learning outcomes compared to students who have low initial knowledge taught with media.

Critical thinking skills underlie high-level thinking, including creative thinking, problem-solving, and decision-making, so they must be mastered first ([Purnamasari & Afriansyah, 2021](#)). Critical thinking skills are essential for students because this ability will help students solve story problems or answer questions related to everyday life. Students who can develop critical thinking skills will find it easier to solve a given problem ([Hinojosa et al., 2020](#); [Syafuruddin & Pujiastuti, 2020](#); [Tiwow et al., 2022](#); [Wahyuni et al., 2022](#)).

Animated video media is social media that is currently very popular among young people, students, and adults. Social media is widely used as a learning resource ([Guckian et al., 2021](#)). Therefore, teachers should utilize animated video media to support students' understanding of learning. It recommends that teachers integrate animated videos of their respective learning materials to get inherent benefits in the learning/teaching context. Animated video media is expected to have a closer relationship with improving students' critical thinking skills. Using animated video media can further improve students' thinking skills.

Conclusion

Based on the results of this study, the use of animation media in Social Science learning at SMP Negeri 10 Padang has proven effective in improving students' critical thinking skills. The results showed that students who were taught using animation media experienced a significant increase in their learning outcomes compared to students who were taught using

conventional methods. This increase can be seen by comparing pretest and post-test scores and increasing student motivation and involvement in learning. Thus, applying animation media can be a fun and innovative alternative to teaching, especially in subjects that require a deep understanding of concepts.

In addition, animation media can create a more dynamic and interactive learning environment. By utilizing this technology, students not only understand the material better but also get the opportunity to develop creativity and problem-solving skills that are very much needed in facing the challenges of the 21st century. This aligns with the demands of education to prepare students to face rapid and complex social changes. Educators must continue to explore and apply various types of innovative learning media, including animation, to improve student learning outcomes. Relevant and interesting animation content can be developed through collaboration between educators and educational technology experts. This will maximize the learning potential in the classroom and ensure that students are actively involved in the learning process. Finally, the results of this research provide an essential contribution to developing more interactive and engaging teaching methods, as well as encouraging further research on the benefits of using animated media in various subjects. With the right approach, animated media can improve students' critical thinking skills and learning outcomes.

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Biographical Notes

SUSY SUARI is the student at Universitas Negeri Padang, Padang, Indonesia.

JUNAIDI INDRAWADI is working at Universitas Negeri Padang, Padang, Indonesia.