

## Effect of Using Audiovisual Learning Media Based on the Canva Application on Students Science Learning Outcomes

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**Abstract:** In response to the growing need for innovative and technology-integrated instructional strategies in science education. This study aims to analyze the effect of using the Canva application-based audiovisual learning media on the science learning outcomes of seventh-grade students on the material of changes in the state of matter. The method applied is a quasi-experiment with a nonequivalent control group design. The population includes all seventh-grade students of SMP Negeri 1 Banjarmasin. Through convenience sampling, a research sample of 60 people was obtained: 30 in class VII D (control) and 30 in class VII E (experimental). Data were collected through a validated, reliable learning outcome test. The data analysis techniques used in this study include calculating averages and standard deviations, performing normality and homogeneity tests, and conducting hypothesis tests. Hypothesis testing in this study was conducted using ANCOVA (Analysis of Covariance). The results of the hypothesis test showed a Sig. value of  $0.001 < 0.05$ , with an effect size of 0.171, which is classified as a small category. Therefore, the decision was made to reject  $H_0$  and accept  $H_1$ . The conclusion of this study is that the use of audiovisual learning media in the Canva application affects the science learning outcomes of grade VII students on the material on changes in state of matter.

**Keywords:** Canva Audiovisual Learning Media; Changes in the State of Matter; Learning Outcomes.

### Introduction

Education is a deliberate and planned effort to create a learning environment and learning process so that students actively develop their potential to have spiritual strength, religious values, self-control, personality, intelligence, noble morals, and the skills needed for themselves, society, nation, and state in accordance with the National Education System Law No. 2 of 2003 [1]. According to the Regulation of the Minister of Education and Culture Number 22 of 2016, teaching and learning activities must be carried out using innovative and creative methods according to student needs in order to achieve educational goals [2]. In the era of globalization, technology is developing rapidly, so education must adapt, and teachers are required to be professional educators who master the ability to plan innovative learning [3].

Based on observations conducted with science teachers at SMP Negeri 1 Banjarmasin, results showed that the use of conventional learning media, such as lectures or less creative media resulted in students paying less attention to the teacher and the lesson, engaging in other activities, and having a poor understanding of the material, resulting in low learning outcomes. Science learning requires media to visualize concepts that are difficult to observe directly. Therefore, media such as images, videos, or animations help clarify abstract concepts.

Selecting the right media can improve learning outcomes. Furthermore, it can help students understand abstract or difficult-to-imagine science concepts concretely. One way to bridge this abstraction gap is by providing appropriate media for learning. When teachers use engaging

media, the material presented by them is easier for students to understand, preventing them from quickly becoming bored and tired while learning, and improving their learning outcomes [4]. As is well known, learning media is highly influential in increasing student motivation to learn because its use makes learning activities appear varied and less monotonous, thereby making students more enthusiastic about participating. Learning media is anything that can be used to convey messages or information in the teaching and learning process, so that it can encourage students' attention and interest [5].

Media in the learning process can facilitate teachers in conveying information or messages. Media can stimulate students' thoughts, feelings, attention, and interest during the learning process, and also help students easily understand what the teacher is saying [6]. In science learning, teachers are the first point of contact with students, enabling them to convey information or messages effectively. They are also tasked with evaluating the learning process accurately and objectively. As facilitators, teachers are expected to create a conducive learning environment and provide learning media that encourage students to easily understand the material [7]. One type of learning media that utilizes technology and is creative and innovative that can be used is audiovisual learning media.

Audiovisual learning media can provide information featuring sound and images, which can be used as an alternative to optimize the learning process. Audiovisual media can increase student attention with an attractive display. Furthermore, students will worry about missing out on the video if they don't pay attention, as it distracts them. Audiovisual media can demonstrate the authenticity of the

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material displayed and provide students with real-life experiences or direct experience of the activities, as students learn the material [8]. Audiovisual learning media can be created using various applications, including Canva.

Canva explains that it is an online design platform that offers various features accessible through its app [9]. Canva also offers engaging audiovisual content for creating learning media. Canva's app has advantages over other apps due to its ease of use and the availability of many free features [10]. Furthermore, each learning medium designed with the Canva app offers a variety of visuals that differ from traditional learning. The audiovisual presentation of material through Canva plays a crucial role in supporting students' cognitive processes, both in understanding concepts and strengthening their memory. Therefore, it can be concluded that the Canva app can be used to develop innovations in designing more creative learning media [11]. Canva makes it easier for teachers and students to implement technology-based learning while encouraging creativity and providing other benefits [12]. Learning media designs created through Canva can increase student interest in learning activities and motivate them through engaging presentations of teaching materials.

The use of the Canva application in science learning has been carried out by Aras and colleagues [13] where their research has demonstrated a positive impact on student learning outcomes. This condition is evident from the increase in student engagement during the learning process. However, during the pretest, some students still obtained scores below the completion criteria. Furthermore, by using Canva-based media according to the predetermined flow, the pretest average of 53.25 increased to 85.75 in the post-test. Thus, the post-test average is higher than the pretest. The difference in increase between the pretest and post-test reached 32.5%.

Based on this description, this study analyzes the influence of Canva-based audiovisual learning media on the science learning outcomes of grade VII students on the material on changes in the state of matter, and aims to determine how much influence the media has on student learning outcomes.

**Research Methods**

A quantitative approach was applied using a quasi-experimental design with a nonequivalent control group. The study was conducted at SMP Negeri 1 Banjarmasin in the odd semester of the 2024/2025 academic year.

The population in this study included all seventh-grade students of SMP Negeri 1 Banjarmasin who were studying changes in the state of matter. The research sample included 30 students from class VII D as the control class, and 30 students from class VII E as the experimental class. The sample was selected through convenience sampling, a sampling method that selects individuals who are easily accessible and available, or who are relatively easy to participate in the research [14]. The following is the research design:

**Table 1.** Nonequivalent Control Group Design

Group	Pretest	Treatment	Post-test
Experimental	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>
Control	O <sub>3</sub>		O <sub>4</sub>

Information:

- O<sub>1</sub> : Pretest of the experimental group
- O<sub>2</sub> : Post-test of the experimental group
- O<sub>3</sub> : Pretest of the control group
- O<sub>4</sub> : Post-test of the control group
- X<sub>1</sub> : Treatment using Canva-based audiovisual media

In this study, Canva-based audiovisual media was used for the experimental class, while conventional media was used for the control class. The treatment was given in two meetings, each lasting 2 sessions (2 × 40 minutes). Data were obtained through a test instrument consisting of 20 multiple-choice questions, which was validated by two lecturers and one junior high school teacher, and tested for validity and reliability. The test was administered in two stages, before and after the treatment, to assess differences in student learning outcomes.

The initial stage of data processing used descriptive statistics, including calculating the mean and standard deviation. Next, inferential statistics were used, starting with prerequisite tests, namely normality and homogeneity tests. After the data met the requirements, hypothesis testing was continued using ANCOVA (Analysis of Covariance). ANCOVA was chosen because it can assess differences in learning outcomes between the two classes while controlling for covariates, thereby providing more precise and objective analysis results. To determine the magnitude of the treatment effect, the effect size can be calculated. All data analysis processes were carried out using IBM SPSS Statistics 21.

**Results and Discussion**

Selecting the right learning media can improve student motivation and learning outcomes. This is inseparable from the teacher's creativity in conducting learning activities. Learning media will facilitate interaction between teachers and students and help optimize the learning process. With appropriate media support, learning objectives will be achieved. Therefore, learning media will influence whether or not information is delivered comprehensively and accurately [11].

Teachers can use the Canva application to create learning media tailored to their needs and preferences. Learning media can be in the form of audio, visual, or audiovisual. Video learning media is one audiovisual medium that can support more engaging learning [15].

The following are images of the Canva-based audiovisual learning media used in this study.



**Figure 1.** Cover of Canva application-based audiovisual learning media



Figure 2. Apperception activity



Figure 7. Conclusion



Figure 3. Example of material presentation on changes in the state of matter



Figure 8. Closing activity



Figure 4. Example of an explanation of the process that occurs when a substance changes state.



Figure 5. Chart of changes in the state of matter



Figure 6. Example of changes in the state of matter in daily life

As shown in Figures 1-8, the Canva application-based audiovisual learning media in this study was used to systematically present material on changes in the state of matter, starting from the opening stage, apperception, presentation of the material, the process, examples of application in daily life, to the closing of the learning. The material on changes in state of matter was presented through structured slides that combined text, visuals, animation, and audio. This helps students better understand the abstract concept of changes in the state of matter in a more concrete way, thereby supporting increased motivation, understanding, and student learning outcomes.

The analysis showed that the use of Canva-based audiovisual learning media affected seventh-grade students' science learning outcomes regarding changes in the state of matter. The learning outcome data is presented in Table 2, which shows the average difference before and after the treatment.

Table 2. Average value of learning outcomes of control and experimental classes

Descriptive Statistic					
Class	N	Min	Max	Mean	Std. Dev
Control (pretest)	30	40	95	65.17	12.763
Control (post-test)	30	25	95	67.50	15.242
Experimental (pretest)	30	30	90	62.67	15.960
Experimental (post-test)	30	45	95	76.83	12.696

Based on Table 2, the average pretest scores for the control and experimental classes are relatively balanced. Meanwhile, in the posttest, the average score for the control class was lower than for the experimental class.

The average posttest score for the experimental class, 76.83, indicates that the use of Canva-based audiovisual learning media has been effective, although the results have not yet reached the very high category. This may be due to

the transition from conventional learning methods to digital media, which requires some students to adapt. In general, the ongoing development of technology and digital learning media has become increasingly evident [16]. In addition, limited meeting duration and the intensity of media use during learning can also hinder students' comprehensive understanding of the material. To maximize understanding of the material from the teacher's delivery, effective and efficient learning can be created through the use of learning media that align with students' needs [17]. Therefore, although Canva-based audiovisual media is effective in increasing student interest, learning outcomes are still influenced by various other supporting factors.

Based on Table 2, the standard deviation value in the control class increased from 12.763 in the pretest to 15.242 in the posttest. This indicates that after implementing conventional learning, student learning outcomes became more varied. Conversely, in the experimental class, the standard deviation value decreased from 15.960 in the pretest to 12.696 in the posttest. This decrease indicates that the treatment with Canva-based audiovisual learning media led to more even, consistent learning outcomes. This means that, in addition to increasing the average score, there was also a decrease in variation in students' understanding. This finding indicates that the treatment provided helped achieve more even learning outcomes. Since standard deviation is a statistical measure of data distribution, a higher standard deviation in a sample indicates greater variation in the data [18-19].

Before testing the hypotheses, the pretest and posttest scores were examined using preliminary tests, namely normality and homogeneity tests. The goal was to verify whether the data met the necessary assumptions before conducting inferential analysis.

**Normality Test**

The normality test used was the Shapiro-Wilk test. This test is performed as a prerequisite for data analysis, ensuring that the data is normally distributed, which is an essential requirement for conducting parametric hypothesis testing. The results of the normality test are shown in Table 3.

**Table 3.** Normality test of the control class and the experimental class

	Treatment	Shapiro-Wilk		
		Statistic	df	Sig.
Mark	Pre (Control)	.972	30	.597
	Post (Control)	.957	30	.263
	Pre (Experimental)	.965	30	.419
	Post (Experimental)	.933	30	.058

The data in Table 3 show that the Shapiro-Wilk normality test results for the pretest and posttest scores of the control and experimental classes meet the assumption of normality. This data is based on the significance values in each group, which are all > 0.05. In the pretest of the control class, the Sig. value was 0.597, and in the post-test, the Sig. value was 0.263, both indicating that the data were normally distributed. Furthermore, in the pretest of the experimental class, the Sig. value was 0.419, and in the post-

test, the Sig. value was 0.058; these results also indicate that the data were normally distributed.

**Homogeneity Test**

Once the data is normally distributed, the next step is to determine the homogeneity value using Levene's test. This test aims to ensure equality of variance between populations and fulfill one of the requirements for parametric hypothesis testing. The results of the pretest homogeneity test for the control and experimental classes are presented in Table 4, while the results for the posttest are presented in Table 5.

**Table 4.** Homogeneity test of the pretest of the control and experimental classes

Levene Statistic	df <sub>1</sub>	df <sub>2</sub>	Sig.
2.064	1	58	.156

From Table 4,  $F = 2.064$ ;  $df_1 = 1$ ;  $df_2 = 58$  and Sig. value =  $0.156 > 0.05$ . These results indicate that the pretest data from both classes are homogeneous.

**Table 5.** Homogeneity test of the post-test of the control and experimental classes

Levene Statistic	df <sub>1</sub>	df <sub>2</sub>	Sig.
.482	1	58	.490

From Table 5,  $F = 0.482$ ;  $df_1 = 1$ ;  $df_2 = 58$  and Sig. value =  $0.490 > 0.05$ . These results indicate that the post-test data from both classes are homogeneous.

**Hypothesis Test**

After the data meet the assumptions of normality and homogeneity, the analysis can proceed to the next stage: testing the hypothesis. A hypothesis is a temporary assumption or answer, expressed as a proposition or statement, whose truth has yet to be tested but is used as a basis for decision-making [21-23]. In this study, the hypothesis test was conducted using ANCOVA (Analysis of Covariance). The testing criteria are if the Sig. value < 0.05, then  $H_0$  is rejected, and  $H_1$  is accepted, indicating that the use of Canva application-based audiovisual learning media has a significant influence on student learning outcomes. Conversely, if the Sig. value  $\geq 0.05$ , then  $H_0$  is accepted, and  $H_1$  is rejected, meaning it does not have a significant influence. The results of the ANCOVA hypothesis test are listed in Table 6.

From Table 6, the ANCOVA results indicate that the learning media column has a significance value of 0.001 (<0.05). This states that  $H_0$  is rejected and  $H_1$  is accepted. Meanwhile, the significance value of 0.000 in the pretest column indicates that the pretest variable has a significant effect on the dependent variable (post-test). In the context of the ANCOVA test, a Sig. value < 0.05 (p-value < 0.05) indicates a significant difference between the tested groups, with the pretest value serving as a covariate to control for other variables, such as learning media. Specifically, a small significance value, such as 0.000, indicates a very strong correlation between the pretest and posttest results, so this needs to be taken into account in the analysis to assess the effects of other factors, such as learning media.

**Table 6.** Hypothesis Testing Using Ancova

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Patrial Eta Squared
Corrected Model	4548.447 <sup>a</sup>	2	2274.224	15.867	.000	.358
Intercept	4318.241	1	4318.241	30.128	.000	.346
Pretest	3241.781	1	3241.781	22.617	.000	.284
Instructional Media	680.911	1	1680.911	11.727	.001	.171
Error	169.886	57	143.331			
Total	25200.000	60				
Corrected Total	12718.333	59				

a. R Square = .358 (Adjusted R Squared = .335)

Therefore, the magnitude of Canva-based audiovisual learning media's influence on learning outcomes can be measured using an effect size test, with the interpretation presented in Table 7.

**Table 7.** Interpretation of Effect Size

Effect Size	Interpretation
$0 < d \leq 0.2$	Small
$0.2 < d \leq 0.5$	Medium
$0.5 < d \leq 0.8$	Large
$d > 0.8$	Very Large

(Cohen, 1998).

The effect size calculation results are shown in Table 6, including the learning media column. The Patrial Eta Squared was 0.171 with a significance value of 0.001. This finding indicates that the effect of the Canva-based audiovisual learning media is relatively small. This means that although the use of this media has been shown to significantly improve learning outcomes, the effect is not significant [24-25].

**Conclusion**

The use of audiovisual learning media in the Canva application on the science learning outcomes of seventh-grade students in the material on changes in state of matter at SMP Negeri 1 Banjarmasin shows a significant influence. Based on the ANCOVA (Analysis of Covariance) results in IBM SPSS Statistics 21, the Sig. The value is 0.001 ( $P \leq 0.05$ ), indicating an effect of learning media use. The use of Canva-based audiovisual learning media has a positive impact on the science learning outcomes of seventh-grade students on the topic of changes in the state of matter, because the presentation of material that combines images, animations, and videos makes abstract concepts more concrete and easier to understand. This media also increases students' interest and motivation to learn, making them more active, focused, and enthusiastic during the learning process. In addition, the use of Canva-based learning media encourages teachers to be more creative and innovative in designing technology-based learning, as well as creating a more interactive and enjoyable learning atmosphere, which ultimately supports the achievement of more effective and student-centered science learning.

**Author's Contribution**

N. Husna: compiled the background, designed the research method, collected and analyzed data, and wrote the manuscript. Sauqina & Y. Khairunnisa: provided guidance, input, and corrections throughout the research

and writing process to ensure compliance with scientific principles, serving as supervisors.

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