The Influence of Using Canva-Based Video Learning Media on Learning Outcomes in Work and Simple Machines Material

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Abstract: The demands of 21st-century learning require the integration of digital and interactive media, as conventional science instruction often fails to optimally engage students and improve learning outcomes. The study aims to investigate the impact of using Canva-based video learning media on students' learning outcomes in the topic "Work and Simple Machines" within the science subject. The use of Canva as a learning tool constitutes a 21st-century educational medium that can provide a more efficient learning experience. It is a learning resource that can be edited and customized according to specific needs. This research is based on the fact that the learning process in schools is still dominated by conventional methods such as lectures and discussions, which results in low student activity and learning motivation. The research design is a one-group pretest-posttest design. The sampling technique used in this study is Cluster Random Sampling. The population of this study consists of students from SMP Negeri 1 Marisa, with the sample tested being class VIII A (n = 30), designated as the experimental class. Meanwhile, the research data were collected using test instruments to determine the level of students' learning achievement. The tests used in this study include prerequisite tests (normality test), hypothesis testing, and n-gain analysis. The results of the hypothesis test indicate that the t-value in all sample classes is greater than the t-table value; thus, H_1 is accepted. Based on the n-gain analysis, a value of 0.68 was obtained in the experimental class, which falls into the high category. The statistical test used in the normality test is the Lilliefors test with a significance level set at 5% ($\alpha = 0.05$). Therefore, the use of Canva-based video learning media has a significant effect on students' learning outcomes in the material on work and simple machines.

Keywords: Canva; Learning Outcomes; Work and Simple Machines.

Introduction

Education has a crucial role in developing an individual's potential comprehensively and in shaping a complete human being. Furthermore, education makes a significant contribution to the intellectual advancement of the nation and enhances the quality of human resources [1]. In a broader context, education is regarded as an integral part of life as it is a lifelong process. In a narrower context, education is often associated with teaching and learning activities within formal institutions such as schools and universities [2].

As time progresses, education has become increasingly integrated with technology, particularly in the Society 5.0 era. This era emphasizes the use of technology to facilitate various aspects of human life, including in the educational sector. With the rapid advancement of technology, the quality of education is also demanded to continuously adapt in order to produce human resources that are competitive and aligned with industry needs [3].

According to the challenges of globalization and technological development, Indonesian society needs to master knowledge, technology, and skills. If the quality of education is not accompanied by technological progress and the adequate capabilities of the younger generation, Indonesia will struggle to compete with other countries that have advanced earlier. Therefore, the application of technology in education becomes a strategic solution to improve the quality of learning [4].

Educational technology plays a vital role in enhancing the effectiveness and efficiency of learning. The Association for Educational Communication and Technology (AECT) defines educational technology as a process that involves people, ideas, tools, organizations, and procedures in analyzing and evaluating learning problems, as well as finding solutions [5]. Technology, whether simple or complex, can be utilized as a learning medium that supports learners' thinking skills and cognitive development.

In the learning process, media play a crucial role as a tool to convey information from educators to students. One of the most commonly used media today is digital-based instructional videos. This type of media is capable of visualizing abstract concepts into more concrete forms, thereby facilitating students' comprehension of the material. The Canva application is a digital platform that enables educators to design interactive and engaging instructional

videos, complete with animations, text, audio, and visual illustrations suited to the content requirements [6]. Visually well-designed media can improve information retention and enhance students' engagement in the learning process [7].

The proper utilization of learning media can enhance students' motivation to learn and their learning outcomes. Canva-based video media, as a form of audiovisual content, has been proven effective in capturing attention and enhancing comprehension, as it effectively integrates visual, textual, and auditory elements. This makes it suitable for explaining conceptual and scientific content, such as "Work and Simple Machines" in the science subject [8].

However, initial observations and interviews with teachers suggest that the majority of the learning process in schools is still dominated by conventional methods, such as lectures and discussions. These methods tend to render students passive and less engaged in the lessons. Furthermore, the limited variety of learning media also contributes to the low participation and academic performance of students [9].

Therefore, innovative efforts are required in delivering lesson materials, one of which is through the use of Canva-based educational videos. This medium is not only easy for teachers to use but also capable of presenting material in a creative and engaging manner for students. Based on this background, this study aims to determine The Influence of using Canva-based video Learning Media on Learning Outcomes in Work and Simple Machines Material.

Research Methods

This study employs a quantitative approach using an experimental method with a one-group pretest-posttest design. The research was conducted at SMP Negeri 1 Marisa, Trans Sulawesi Road, South Marisa Village, Marisa District, Pohuwato Regency, Gorontalo Province. During the odd semester of the 2024/2025 academic year, the study was carried out over approximately one semester.

The subjects of this study were eighth-grade students at SMP Negeri 1 Marisa. Class VIIIA, consisting of 30 students, was designated as the experimental group. The sample selection was carried out using a cluster random sampling technique. The steps carried out are as follows: 1) The experimental class was administered a pretest. 2) The experimental class was provided with learning media assisted by Canva using a cooperative model. 3) The experimental class was administered a posttest.

The research data utilized the learning outcomes from pretests and posttests of the students. An objective written assessment consisting of 15 questions and 5 essay questions was used as the test instrument in this study. The research data were analyzed using n-gain analysis, hypothesis testing, and normality data testing. Researchers use manual data processing due to the characteristics studied in simple research, and the availability of the required software can be optimized through Excel processing.

Normality Data Test

The normality test is used to examine the normality of the variables under study, whether the data are normally distributed or not [10]. The decision-making is based on whether the value $L_{count} > L_{table}$ therefore H_0 are rejected, and if $L_{count} < L_{table}$ H_0 are accepted. The statistical test used was:

H_0 : The data is normally distributed
H_1 : The data is not normally distributed

The statistical test employed in the normality assessment is the Lilliefors test, with a significance level of 5% (0.05), as determined by the following formula:

$$Z_i = \frac{x - x_2}{s}$$

Description:

X = the sample average used in the formula $X = \frac{\Sigma \quad xI}{n}$
S = the standard deviation obtained using the formula

$$s = \frac{\sqrt{(\Sigma \quad xi - xI)2}}{n-1}$$

To accept or reject the null hypothesis (H_0), one compares this L_0 with the critical value L at the selected level of significance.

Hypothesis Test

Hypothesis testing was conducted to investigate whether the use of Canva-based animated video learning media, combined with a cooperative learning model, has an impact on students' learning outcomes. Based on the data obtained in this study, a statistical hypothesis test was performed, specifically the t-test. The t-test formula is described as follows [11]:

$$t = \frac{x - \mu_0}{\frac{S}{\sqrt{n}}}$$

Description:
t   = The calculated t value
$\underline{x}$ = xi average
μ_0 = Hypothesized value
s   = Standard deviation
N   = The number of research subjects

N-gain Test

The N-gain test is conducted to measure the effectiveness of a learning process or intervention in educational research. It is performed to determine students' cognitive gains through learning. In this study, the learning of work and simple machines material using the cooperative learning model of the Think-Pair-Share type, the N-gain test has the following formula:

$$N\text{-gain} = \frac{Posttest\ Score - Pretest\ Score}{Ideal\ Score - Pretest\ Score}$$

Table 1. N-Gain Criteria

Criteria	$g \geq 0.7$	High
	$0.3 \leq g \leq 0.7$	Medium
	$g \geq 0.3$	Low

Results and Discussion

Main After administering the initial test (pretest) and the final test (posttest), the research findings concerning the effect of using Canva-based learning media on students' learning outcomes in business and simple machines were determined. The researcher utilized the n-gain test, hypothesis testing, and data normality testing to assess students' learning outcomes.
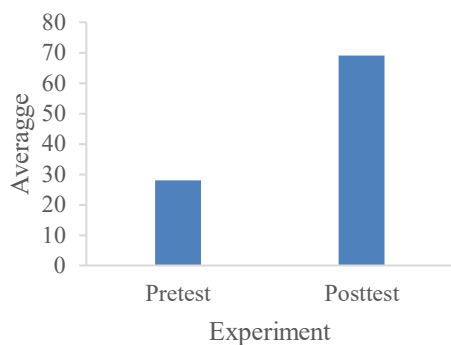

Figure 1. Average Score of Students

Figure 1 above illustrates a diagram showing the percentage of student learning outcomes in the experimental class, which used the Think Pair Share model integrated with Canva-based educational video media on the topic of work and simple machines. The pretest and posttest data indicate a difference in scores, reflecting an improvement in learning outcomes. This demonstrates that the use of educational videos as an independent variable can positively influence students' ability to comprehend the concepts of work and simple machines.

Table 2. Normality Test Results

Liliefors's Test			
Class	L_{count}	L_{table}	Description
Experiment	0.159	1.696	Normal Distributed

Based on the results of the normality test in the table above, the L_{count} value for the experimental class is 0.159, compared to the L_{table} value of 1.696. Therefore, it can be concluded that the research data are normally distributed. According to the findings, which are consistent with previous research, the L_{count} value is smaller than the L_{table} value, so it can be concluded that the research data are normally distributed [12].

Table 3. Hypothesis Test Results

Class	t_{count}	t_{table}	Status
Experiment	4.252	1.696	H_0 rejected

Table 2 shows the results of hypothesis testing using the t-test in the experimental class. Based on the calculations, the t_{count} for the experimental class is 4.252. This value is greater than the t_{table} value of 1.696 at the applied significance level. This means that H_0 is rejected, so it can be concluded that there is a significant difference between the average results obtained and the criteria tested. In other words, the treatment or method applied has a real effect on the measured outcomes.

According to the results, which align with previous research, if the t_{count} is greater than the t_{table}, the outcome is that H_0 is rejected and H_1 is accepted. There is a significant effect of using Canva on students' learning outcomes, and it can lead to an improvement in achievement based on the results obtained [13].

Previous research has shown that the T test statistic value provides information indicating that if the T_{table} value is smaller than the calculated T, H_0 is rejected. The research conducted yields similar results for determining data significance and the relationships required to understand the relevance of these findings [14].

Table 4. Analysis of Students' Learning Outcomes Using N-gain

No.	Class	N-Gain	Status
1.	Experimental	0.68	High

Based on Table 3, the average normalized gain (N-gain) in the experimental class reached 0.68. This N-gain value reflects the level of improvement in students' learning outcomes after participating in the instruction. The higher value in the experimental class indicates that the teaching approach or learning media implemented in that class had a greater effect.

In previous studies, the experimental class achieved higher learning outcomes because the use of educational video media had a positive impact on students' learning. By participating in learning that utilizes video media, students become more interested in learning, pay more attention to the material, find it easier to understand the content, and when given test questions, many students are able to answer correctly. This, in turn, leads to an improvement in learning outcomes, which are higher than those of students who follow learning without using video media [14].

The use of video learning media in the experimental class can encourage students to be more engaged in class due to their interest in the presented videos, and can enhance optimal learning outcomes. Based on the analysis of data from previous research, it has been demonstrated that the use of video learning media affects students' learning outcomes and their critical thinking skills. This is evidenced by the higher learning outcomes of students in the experimental group who used video learning media [15]. Figure 3 presents the process of creating Canva video learning media developed by the researcher.
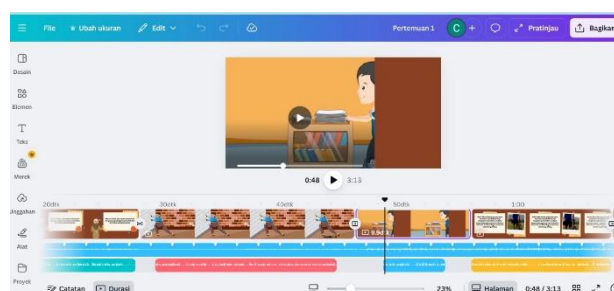

Figure 2. Canva Media in Learning (Editing Process)

The research findings indicate a difference in students' learning outcomes for the topic of Work and Simple Machines before and after using Canva-based video learning media. The results of the pretest and posttest show an improvement in learning outcomes in the experimental class.

For objective questions, the experimental class's average score increased from 32 to 81, and for essay questions, the average score rose from 9 to 80. This improvement indicates that the learning conducted has an impact on students' understanding of the material. The results show the effectiveness of using learning media in promoting active participation and understanding of basic concepts [16].

This illustrates that the use of Canva-based video media helps students to understand the material more deeply, as reflected in their ability to express their understanding in written form. Visual media, such as animated videos, can help students integrate verbal and visual information, thereby enhancing their conceptual understanding [17]. The effectiveness of learning through Canva videos is also supported by other research findings, which indicate that interactive videos can enhance student engagement and motivation for learning. Within the learning context, this increase in engagement directly contributes to better academic performance, as students are encouraged to actively participate in the learning process and gain a deep understanding of the material [18]. Therefore, implementing Canva-based video learning media can be an effective strategy to improve learning outcomes, both in terms of cognitive comprehension and overall mastery of the material.

The normality test using the Lilliefors test indicates that the data from both classes are normally distributed, with an L-calculated value < L-table. This means that the data are suitable for analysis using parametric statistical techniques. Data normality is a crucial requirement in hypothesis testing, as it ensures the validity of the results of subsequent statistical analysis [10]. With the fulfilment of the normality assumption, the results of the hypothesis test can be trusted as a representation of the relationship between the independent variable (Canva video learning media) and the dependent variable (student learning outcomes).

The hypothesis test yielded a calculated t-value of 4.252 in the experimental class. This suggests a significant difference in students' learning outcomes before and after the treatment. Therefore, H_0 is rejected, and H_1 is accepted. This suggests that the use of Canva-based instructional video media has a significant impact on improving students' learning outcomes. These findings align with previous research [2], which has shown that interactive video media can significantly enhance student engagement and learning outcomes. Furthermore, the N-Gain test results indicate that the improvement in learning outcomes in the experimental class was considered high (0.68), while the replication class fell into the medium category (0.59). This demonstrates that although both classes experienced improvements, the experimental class using Canva-based videos achieved greater gains.

Canva-based video learning media are utilized to enrich the learning process by providing enjoyable and meaningful interactions [19]. Canva was chosen because it is free, easily accessible, and user-friendly, thereby facilitating teachers in designing engaging instructional videos. Canva offers a variety of templates, visual elements, and animation features that can help explain abstract concepts in the topics of work and simple machines in a more concrete and tangible way [20].

The effectiveness of Canva video media in enhancing learning outcomes can be explained through a multimodal learning approach, where students receive information in various forms (text, images, sound). This approach helps students with visual and auditory learning styles to understand the material better [21]. Engaging video media also enhances student focus and motivation, which ultimately impacts the improvement of learning outcomes [22]. In addition to learning outcomes, this study also aims to describe students' responses to the use of Canva-based video media. Based on the results of observations and interviews, the majority of students provided positive feedback. They stated that the video media helped them understand the material more easily and made learning more enjoyable. This media is considered not only informative but also visually appealing, thereby increasing learning enthusiasm [23].

Positive feedback from students is very important because their perception of learning media can influence their engagement in the learning process. Students who feel comfortable and interested in the learning media will demonstrate more active participation, which ultimately impacts learning achievement. Therefore, the use of media that aligns with students' preferences and characteristics becomes a crucial factor in learning planning [24]. Overall, the results of this study indicate that Canva-based video media are effective in enhancing students' learning outcomes on the topic of Work and Simple Machines. This media not only helps students understand the concepts more clearly but also boosts their motivation and engagement in the learning process. Therefore, the use of technology-based media such as Canva is strongly recommended for implementation in learning in the current digital era.

Conclusion

This research has several limitations that need to be considered. First, the research was conducted on only one experimental class with a limited number of participants; therefore, generalizing the results should be done with caution. Second, the duration of treatment using Canva-based video media was relatively short and may not accurately reflect the long-term effects on students' learning skill development. In addition, the data analysis was still conducted manually, so the accuracy and depth of the analysis were not yet optimal compared to the use of statistical software. Based on these limitations, it is recommended that future research involve a larger and more diverse sample to ensure that the findings can represent a wider population. Subsequent studies may also employ a longer intervention duration and utilize modern statistical analysis tools to strengthen the validity of the findings. Additionally, future research could investigate the use of Canva media in other learning models or across various science subjects to examine the consistency of its impact on student learning outcomes.

Author's Contribution

Patricia Sasmita Kadir, as the main author, conducted data analysis and wrote the main manuscript. Dr. Supartin, S.Pd., M.Pd. and Dr. Abdul Haris Odja, S.Pd., M.Pd. provided guidance, academic supervision, and critical revisions to the manuscript. Dr. Trisnawaty Junus Buhungo, S.Pd., M.Pd.; Lukman Samatowa, S.Si., M.Si.; and Dr. Raghel Yunginger,

S.Pd., M.Pd. contributed through conceptual feedback and critical evaluation of the results and discussion.

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