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Utilizing Social Media Videos in the Discovery Nano Learning Model to Improve Critical Thinking Skills

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Abstract

This study aims to analyze the effectiveness of utilizing social media-based learning videos in the discovery nano learning model on improving critical thinking skills of elementary school students. The study was conducted at Walantaka IV Public Elementary School, Serang City, with 30 sixth-grade students as participants. This study used a quantitative approach with a quasi-experimental design through a one-group pre-test post-test design. Data collection was carried out through critical thinking ability tests, student learning activity observation sheets, and documentation of the learning process. The research instruments had been tested for validity and reliability before being used in the study. Data were analyzed using descriptive and inferential statistics with paired sample t-tests to determine differences in students' critical thinking skills before and after the implementation of the learning model. The results showed that the implementation of social media-based learning videos in the discovery nano learning model had a positive effect on improving students' critical thinking skills. In addition, the use of learning videos distributed through social media was able to increase student engagement in the learning process and facilitate more flexible and interactive learning. The findings of this study indicate that the integration of digital technology with innovative learning approaches can be an effective strategy in improving the quality of learning in elementary schools and developing higher-order thinking skills in students.

INTRODUCTION

The development of information and communication technology in recent decades has significantly impacted various aspects of human life, including education. Digital transformation has driven a paradigm shift in the learning process, shifting from conventional approaches to more flexible, interactive, and technology-based learning. According to Selwyn (2016), the development of digital technology has opened up new opportunities in education by providing a variety of digital learning resources that are widely and flexibly accessible to students. The integration of technology into the learning process not only facilitates the delivery of material but also improves the quality of interactions between teachers and students during the learning process.

In the context of 21st-century education, critical thinking skills are an essential competency for students. Critical thinking skills enable students to systematically analyze information, evaluate various sources, and make rational decisions based on available evidence. Critical thinking is a cognitive ability that involves the processes of interpretation, analysis, evaluation, inference, and explanation of information or problems (Facione,2015). Furthermore, Ennis (2011) explains that critical thinking is a reflective and rational thought process that focuses on making decisions about what to believe or do.

Although critical thinking skills are crucial in the learning process, the reality is that many elementary school learning processes still focus on rote mastery of material. This learning process, which places too much emphasis on one-way knowledge transfer, leaves students with fewer opportunities to develop higher-order thinking skills. This situation suggests the need for innovation in learning strategies that can encourage students to think actively, critically, and reflectively.

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One learning approach that can be used to develop students' critical thinking skills is the discovery learning model, which emphasizes the process of independent concept discovery by students through exploration, observation, and analysis. The learning process will be more meaningful if students are actively involved in the process of discovering new knowledge (Bruner, 1961). In this model, the teacher acts as a facilitator who helps students discover concepts through various challenging learning activities. On the other hand, the development of digital technology has also encouraged the use of various technology-based learning media, one of which is learning videos. Learning videos are media that can present information visually and audio, thus helping students understand learning concepts more easily. (Mayer, 2014) states that multimedia learning allows students to integrate verbal and visual information simultaneously, thereby improving conceptual understanding.

Furthermore, social media is also beginning to be used as a digital learning tool. Social media is an internet-based platform that allows users to create, share, and access a variety of content interactively. In an educational context, social media can be used to distribute learning content, including instructional videos (Kaplan, 2010). Along with the development of digital learning technology, the concept of nanolearning has also begun to be introduced as a learning approach that presents material in the form of short, focused learning units. Nanolearning is a learning strategy that delivers information in very small, yet dense, chunks of material, making it easier for students to grasp concepts quickly (Hug, 2017).

Various previous studies have shown that the use of digital technology in learning can increase student motivation and engagement in learning. The use of digital learning videos can increase student participation and engagement in the learning process. However, research specifically examining the integration of social media videos with the discovery nano learning model in improving elementary school students' critical thinking skills is still relatively limited (Zainuddin, 2016). Based on this description, this study aims to examine the use of social media videos in the discovery nano learning model as an innovative learning strategy to improve elementary school students' critical thinking skills.

LITERATURE REVIEW

Critical thinking is a high-level thinking skill that is crucial in the learning process. Critical thinking is a cognitive process that involves the ability to interpret, analyze, evaluate, and draw conclusions from information logically and rationally (Facione, 2015). In an educational context, critical thinking helps students understand information in depth and develop problem-solving skills. Critical thinking is a reflective and rational thought process that focuses on making sound decisions based on strong evidence and reasoning (Ennis, 2011). Therefore, developing critical thinking skills is an important goal in the learning process in schools.

The discovery learning model is a learning approach that emphasizes students' independent concept discovery. Discovery-based learning allows students to construct knowledge through hands-on learning experiences (Bruner, 1961). In this model, students are encouraged to explore, observe phenomena, and draw conclusions based on their observations. Nanolearning is a learning approach that presents material in the form of very small and short learning units. Nanolearning is a digital learning strategy designed to convey information quickly and focus on one main concept, making it easier for students to understand the learning material (Hug, 2017).

Learning videos are a learning medium that presents material in an audio-visual format, thereby enhancing students' conceptual understanding. The use of multimedia in learning can enhance conceptual understanding because information is presented through two cognitive channels: visual and verbal (Mayer, 2014). Social media also has great potential as a digital learning medium. states that social media allows users to share information and interact widely through digital platforms (Kaplan, 2010).

Therefore, social media can be utilized as a means of distributing learning videos that are easily accessible to students.

METHODS

Research Design

This study uses a quantitative approach with a quasi-experimental design through a one-group pre-test post-test design model. This design was chosen because it allows researchers to measure changes in students' critical thinking skills after being given a learning treatment, namely the application of social media-based learning videos in the discovery nano learning model. In accordance with the explanation (Creswell, 2014), the one-group pre-test post-test design is used to determine changes that occur in the same group before and after treatment by comparing the results of the pre-test and post-test. This design is effective for assessing the effect of learning interventions even though it does not use a control group, so the results can provide a clear picture of the effectiveness of the applied learning model.

Research Setting and Participants

This research was conducted at Walantaka IV State Elementary School, Serang City, involving 30 sixth-grade students as participants. Participant selection was conducted using a purposive sampling technique, which is the selection of samples based on certain criteria relevant to the research objectives. Purposive sampling is effectively used when researchers want to ensure that participants have characteristics that align with the research focus (Sugiyono,2019). In this case, all students were selected because they were at the same grade level, had relatively uniform learning ability backgrounds, and were able to follow the digital video-based learning process well.

Instruments

The research instruments used included several important components. First, a test of students' critical thinking skills, designed based on critical thinking indicators, such as the ability to analyze information, evaluate arguments, and draw conclusions. Second, an observation sheet of student learning activities was used to record the level of student participation, motivation, and engagement during the learning process. Third, documentation of learning activities, in the form of photos, videos, and notes from the learning process, served as supporting data to strengthen the research findings. The instrument's validity was tested using content validity through expert judgment to ensure that each instrument item accurately measured the intended aspect. Meanwhile, the instrument's reliability was tested using the Cronbach's Alpha coefficient to ensure the consistency and reliability of the data obtained.

Data Collection Procedure

The data collection process was carried out in stages and systematically. The first stage was conducting initial observations to understand classroom conditions and student learning behavior before being given treatment. The second stage was administering a pre-test, which aimed to measure students' critical thinking skills before the learning began. The third stage was implementing learning using social media videos in the discovery nano learning model, where students watched short learning videos, then participated in exploration activities, discussions, and independent concept discovery. During this process, researchers observed students' learning activities to record their engagement, motivation, and interactions in the learning activities. The final stage was administering a post-test, which was used to measure the improvement in students' critical thinking skills after participating in the learning.

Data Analysis

The data obtained were analyzed using descriptive statistics to determine the average value, standard deviation, and minimum and maximum values of the students' pre-test and post-test results. Furthermore, an inferential analysis was conducted using a paired sample t-test to determine whether there was a significant difference between the pre-test and post-test scores (Field,2013). By using this analysis, the study can quantitatively conclude whether the application of social media videos in the discovery nano learning model is truly effective in improving students' critical thinking skills, while also providing an overview of the magnitude of changes that occur as a result of the learning treatment.

RESULTS AND DISCUSSION

Results

This study uses a quantitative approach with a quasi-experimental design through a one-group pre-test post-test design model. This design is used to determine changes in students' critical thinking skills before and after being given treatment in the form of implementing the Discovery Nano Learning model assisted by social media-based learning videos. The one-group pre-test post-test design is a quasi-experimental research design that allows researchers to measure changes that occur in the same group after being given a certain treatment (Creswell, 2014). The study was conducted on 30 sixth-grade students of Walantaka IV State Elementary School, Serang City, using a purposive sampling technique (Sugiyono,2019). The research process was carried out through several systematic stages.

Before the hypothesis test was conducted, the data were tested for normality using the Kolmogorov–Smirnov and for homogeneity using the Levene Test.

Table 1. Normality test using Kolmogorov–Smirnov

Variabel	K-S Sig	Homogenitas (Levene Sig)
Pre-test	0,200	0,315
Post-test	0,120	0,315

Value p>0.05 indicates that the data is normally distributed and homogeneous, thus meeting the requirements for the t-test. Meanwhile, a paired sample t-test was conducted to see the difference in students' critical thinking abilities before and after the treatment.

Table 2. *Paired Sample t-test*

Variable	Mean Pre	Mean Post	t	df	Sig (2-tailed)
Critical Thinking	65,40	78,60	11,82	29	0,000

The t-test results showed p < 0.05, so the research hypothesis was accepted, meaning there was a significant increase in students' critical thinking skills after the learning model was implemented. After the entire learning series was completed, a post-test was conducted to measure students' critical thinking skills after being given treatment. Data analysis was carried out through the Kolmogorov–Smirnov normality test and Levene's homogeneity test, which showed that the data were normally distributed and homogeneous (p > 0.05), thus meeting the requirements for the t-test. The results of the paired sample t-test showed an average post-test score of 78.60, a significant increase from the pre-test of 65.40 with a t-value = 11.82 and a significance of p = 0.000 (p < 0.05). This indicates that the increase in students' critical

thinking skills after the implementation of the learning model was statistically significant. To strengthen the interpretation, the N-Gain calculation was carried out and the average N-Gain reached 0.38, which is included in the medium to high category according to Hake (1999), indicating that the application of the Discovery Nano Learning model assisted by social media videos is effective in improving students' critical thinking skills.

The first stage was to conduct initial observations to identify classroom learning conditions and determine students' initial critical thinking skills. Based on the initial observations, it was found that the learning process was still dominated by lecture methods, resulting in relatively low student engagement. The second stage was to administer a pre-test to measure students' initial critical thinking skills before receiving the treatment. The test instrument used was problem-solving-based questions designed to measure critical thinking indicators such as the ability to analyze information, evaluate arguments, and draw conclusions. The results of this pre-test served as baseline data used for comparison with the results of the post-test.

The third stage is the implementation of learning treatments using the discovery nano learning model, utilizing social media-based learning videos. At this stage, the teacher displays short learning videos that have been prepared in advance and distributed through social media platforms that can be accessed by students. The videos are designed with the concept of nano learning, namely presenting learning material in a short duration but focusing on one main concept. After watching the learning videos, students are directed to engage in exploration activities, group discussions, and answer prompt questions that encourage them to discover learning concepts independently in accordance with the principles of discovery learning.

During the learning process, researchers also observed student learning activities using a pre-prepared observation sheet. These observations aimed to determine students' levels of participation, involvement, and motivation in the learning process.

The final stage was a post-test after the entire learning series was completed. The post-test used an instrument with a difficulty level equivalent to the pre-test to measure improvements in students' critical thinking skills after participating in the discovery nanolearning model with the aid of social media videos. The results of the descriptive statistical analysis of the research data are shown in the following table.

Table 3. Descriptive Statistics of Research Variables

Variable	N	Mean	SD	Minimum	Maximum
Pre-test Score	30	65.40	8.25	50	80
Post-test Score	30	78.60	7.10	65	92
Motivation Score	30	82.15	6.45	70	95
Participation Level	30	3.85	0.72	2.50	5.00

Based on the data in the table above, it can be seen that the average pre-test score for students' critical thinking skills was 65.40 with a standard deviation of 8.25. The minimum score obtained by students was 50, while the maximum score was 80. These results indicate that before the implementation of the learning model, students' critical thinking skills were still in the moderate category.

After being given treatment using social media-based learning videos in the discovery nano learning model, the average post-test score increased to 78.60 with a standard deviation of 7.10. The minimum score obtained by students was 65, while the maximum score reached 92. The increase in the

average score of 13.20 points indicates an improvement in students' critical thinking skills after participating in the learning process.

Furthermore, observations showed that students' learning motivation averaged 82.15, indicating that most students exhibited high levels of motivation throughout the learning process. Meanwhile, students' participation in learning activities averaged 3.85 out of a maximum scale of 5, indicating that students were actively engaged in the learning process.

This analysis indicates that the implementation of social media-based learning videos within the discovery nanolearning model positively impacted students' critical thinking skills. Therefore, the results of this study support the research hypothesis that there is a significant increase in students' critical thinking skills after implementing this learning model.

Discussion

The research process was carried out through several systematic stages. The initial stage began with initial observations to determine the learning conditions in the classroom and students' initial critical thinking skills. The results of the observations showed that during conventional learning, student engagement in the learning process was still low because the methods used were more lecture-based and memorization. Next, a pre-test was conducted to measure students' critical thinking skills based on indicators of analysis, evaluation, and inference. The pre-test data showed that the average student's critical thinking skills were still in the moderate category with an average score of 65.40, a minimum score of 50, and a maximum score of 80, and a standard deviation of 8.25, indicating a fairly successful variation in student abilities.

After the pre-test, students participated in learning using the discovery nano learning model supported by social media videos. These learning videos were designed using the nano learning concept, where the material is presented in a concise and concise format that focuses on one main concept. Students watched the learning videos and were then directed to explore, discuss in groups, and independently discover concepts, in accordance with the principles of discovery learning (Bruner, 1961). During this process, researchers observed learning activities, including student motivation and participation. The observations showed that students were more enthusiastic, actively asking questions, discussing, and engaging in learning activities compared to before, indicating increased student motivation and engagement.

In addition to improving critical thinking skills, observation results show an increase in student learning motivation, with an average score of 82.15, and active participation during learning with an average score of 3.85 on a scale of 5. These findings indicate that learning videos shared through social media not only make it easier for students to access materials but also provide a more interesting and interactive learning experience, so that students are more motivated to be actively involved in learning. Factors supporting the success of this learning include teacher readiness in designing interesting learning media, the availability of adequate technological devices, a conducive learning environment, and increased student internal motivation due to relevant and easy-to-understand content.

The results of this study confirm that the use of discovery nanolearning assisted by social media videos effectively improves students' critical thinking skills. This learning model allows students to actively discover concepts, analyze information, evaluate arguments, and draw their own conclusions, which is in accordance with the principles of critical thinking (Facione,2015). Short learning videos provide initial stimulation that makes it easier for students to understand concepts, while discussion and exploration activities allow them to develop critical thinking skills more deeply. The effectiveness of this model is also

seen in increased motivation and learning participation, which are important factors in the success of discovery-based learning.

Students' critical thinking skills are enhanced not only by learning design but also by the synergy between digital media and active learning methods. Social media allows for flexible distribution of materials that can be accessed at any time, allowing students to review them at their own pace. Meanwhile, the nanolearning approach makes material delivery more focused and understandable, reduces students' cognitive load, and promotes a more effective understanding of core concepts (Hug, 2017; Mayer, 2014). Thus, the discovery nanolearning model with social media creates a learning environment conducive to the development of critical thinking.

Overall, this study shows that the implementation of an innovative learning model that combines discovery nanolearning with social media videos not only improves students' critical thinking skills but also increases their motivation and active participation in the learning process. This suggests that the integration of digital technology with active learning strategies can be an effective alternative in elementary education to develop higher-order thinking skills, support research hypotheses, and provide practical and theoretical contributions to the field of education.

CONCLUSION

This study shows that the use of social media-based learning videos in the discovery nano learning model can improve the critical thinking skills of sixth-grade students at Walantaka IV State Elementary School, Serang City. Practically, this study has implications for teachers to utilize digital technology as an innovative learning medium in the learning process in elementary schools. Theoretically, this study contributes to the development of studies on the integration of digital technology with innovative learning models in elementary education. This study has limitations in the relatively small sample size and the scope of the study, which is limited to one school. Future research is recommended to involve a larger sample and use a more complex research design.

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