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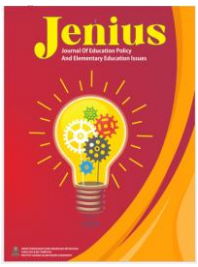

The Influence of Lecture and Question and Answer Methods Assisted by Video Learning Media on Primary School Students' Science Critical Thinking Abilities

Rosa Susila Prestikadini[1], Erlinda Rahma Dewi[2]*

[1] Islamic Elementary School Teacher Education, Faculty of Education, Universitas Islam Negeri Raden Mas Said Surakarta, Indonesia
[2] Mathematics Education, Faculty of Education, Universitas Islam Negeri Raden Mas Said Surakarta, Indonesia

*Corresponding author: erlinda.dewi@staff.uinsaid.ac.id

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ABSTRACT

The ability to think critically is a process of understanding and examining a problem or object by actively considering and evaluating statements and ideas that have meaningful value. This study aims to determine students' critical thinking skills in science subjects after being given treatment by applying lecture and question-and-answer methods with the help of video learning media. This research was conducted at Madrasah Ibtidaiyah Muhammadiyah Klaseman Gatak. The study was conducted in November 2022. The research method used is pre-experimental—*d*ata analysis using a *paired sample t-test*. The instrument used in this study is a critical thinking ability test in the form of a description of 9 questions. Validation in this research instrument is expert validation and empirical validation. Expert validation was given to two expert lecturers, and empirical validation was given to 21 grade IV B MI Muhammadiyah Klaseman students. The study sample was 22 students in class IV A, with a population of 43. The study's results averaged *a pretest* score of 57.24 while the average *posttest score of* 63.47 obtained a significant value, 0.069>0.05, so Ho was accepted, and Ha was rejected. It can be concluded that there is no significant influence on the use of lecture and question-and-answer methods with the help of learning media on students' critical thinking skills in grade IV science subjects at Muhammadiyah Islamic Elementary School Klaseman.

INTRODUCTION

Based on the quadrennial study International Trends in International Mathematics and Science Study (TIMSS) by The International Association for the Evaluation of Educational Achievement (IEA) in 2015, with the target population of Indonesian students in grade 4

elementary school students to measure the achievement of Mathematics and Science Elementary Students in international studies. Science scores according to surveys from TIMSS in 2007, 2011 and 2015 were 397, 386 and 397 respectively. The achievement of the Science (IPA) score placed Indonesia ranked 36 out of 49 (2007) with an average score of 397, ranked 38 out of 42 countries (2011) with an average score of 386 and ranked 44 out of 49 countries (2015) with an average score of 397 (Hadi, 2019). Based on the observations, several problems were found, including science learning in grade IV is still dominant. The teacher only explains, and students listen to the teacher's explanation. Based on students' daily test scores on energy source materials, five students have not reached the Minimum Completeness Criteri (KKM)) score of 70. The daily test questions in the material do not fully cover the questions of higher-order thinking skills categories such as cognitive level of evaluating (C4) to creating (C6). In addition, the learning media used is still limited and less varied; teachers only use books and image media as learning media.

According to Kuswana & Sunaryo (2011), critical thinking is the analysis of problem situations through potential evaluation, problem-solving and information synthesis to determine decisions. Critical thinking skills encourage students to be active, develop trust and take action. Meanwhile, Fisher and Scriven (2009) define critical thinking as creative and active interpretation and evaluation of observation and communication, information and argumentation. In 21st-century skills learning, teachers should encourage students to pay close attention to the learning process. This study aims to see the influence of lecture and question-and-answer methods assisted by video learning media on students' critical thinking skills. The ability to think critically of students is essential. 21st-century skills called 4C are skills that students must have to provision in the 21st century (Septikasari, 2018). The role of teachers in science learning is very important to trigger students' thinking skills, for example, in the use of learning media. The benefits of using learning media are that it can stimulate critical thinking skills and express students' ideas scientifically (Mulyadi et al., 2016). Learning videos are suitable to apply because, according to Lumatenggo (2011), one of the advantages of exciting videos that videos are good if involved in learning is that videos can display objects that are too small, too large, dangerous, or even those that students cannot find directly. This is the reason for choosing video learning media among other learning media. Video learning media is expected to provide a more detailed understanding to students.

In addition to learning media, learning methods affect the learning process. According to Sanjaya (2010), the lecture method can be interpreted as presenting lessons through oral

narration or direct explanation to a group of students. According to Sudjana (2010), the question-and-answer method is a teaching method that allows direct communication that is *two-way traffic* because, at the same time, there is a dialogue between teachers and students. Teachers ask students to answer, or students ask teachers to answer; in this communication, there is a direct reciprocal relationship between students. Based on some of the descriptions above, it is essential to research the influence of lecture and question-and-answer methods assisted by video learning media on students' critical thinking skills in grade IV science subjects at Madrasah Ibtidaiyah Muhammadiyah Klaseman, Gatak, Sukoharjo. The following are things that will be examined in this study: (1) The effect of using lecture and question and answer methods assisted by video learning media on critical thinking skills in grade IV science subjects; (2) Application of lecture and question and answer methods assisted by video learning media in class IV science subjects.

METHOD

This type of research uses pre-experimental research, namely *pretest-posttest design* (Arikunto, 2002). The following is a drawing of the research design design:

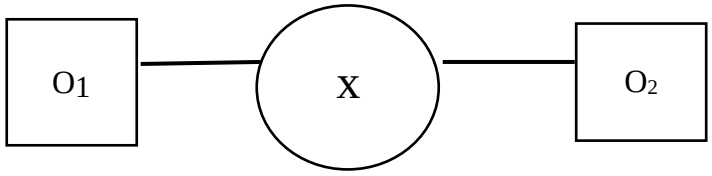


Figure 1. Research Design Chart

Information:

O1 = *Pretest*

X = Treatment or Behavior

O2 = *Posttest*

Figure 1. Demonstrate the design of the pre-experimental research design. Experimental research is used if the researcher wants to know the cause-and-effect influence between independent and dependent variables. The study was conducted in November 2022. The population in the study was all grade IV A and B students of MI Muhammadiyah Klaseman for the 2021/2022 academic year, as many as 43 students. The study sample comprised 22 class IV A students, 17 boys and five girls. This research uses a *simple random sampling technique.* This research instrument consists of 9 critical thinking skills questions in descriptions. Instruments

on critical thinking skills include several critical thinking indicator grids that can be seen in Table 1.

Table 1. Critical Thinking Skills Test Grid

No	Indicator
1	Focusing questions Analyzing Arguments. Ask and answer challenging questions.
2	Consider the credibility (criteria) of a source. Observe and consider the results of observations.
3	Make an induction and consider the results of the induction. Create and determine the results of considerations.
4	Make deductions and consider the results of the deduction. Defining terms, considering a definition. Identify assumptions.
5	Deciding on a course of action. Interact with other people.

(Finken & Ennis, 1993)

According to Hendryadi (2017), content validation is estimated by testing the suitability of the test content through competent rational analysis or expert judgment. Validation of this instrument is carried out using expert validation and empirical validation. Expert validation was done by two expert lecturers, and empirical validation was done by 21 students from class IV B at Muhammadiyah Islamic Elementary School Klaseman. The validated instruments were lesson plans, students' worksheets, instruments about critical thinking skills and tests for the suitability of video learning media with learning materials. Measurement of critical thinking skills uses pretest and posttest scores. Data analysis used the paired sample t-test. Prerequisite test analysis uses the normality test.

RESULTS AND DISCUSSION

This pre-experimental research was conducted to determine the effect of a lecture and question-and-answer method assisted by video learning media on students' critical thinking abilities in science learning in class IV at Muhammadiyah Islamic Elementary School Klaseman.

Based on the results of the problem formulation and research objectives, data were collected to determine the effect of using lecture and question-and-answer methods assisted by video learning media on students' critical thinking abilities in class IV science learning at Muhammadiyah Islamic Elementary School Klaseman, Gatak, Sukoharjo. Data on the results of

students' critical thinking skills were obtained through a pretest at the first meeting and a posttest at the last meeting in class IV A. The pretest was carried out using a description test with a total of 9 questions given to 22 students, and the highest score of 85 and the lowest score of 15 were obtained. Student scores were in categories. Still below the KKM 70, namely 15 students, in the form of a percentage, around 68% of students have not reached the KKM. Students scoring above KKM 70 are seven, in the form of a percentage of around 32% of students who have reached the KKM.

Meanwhile, the same posttest data was obtained from working on a description test of critical thinking skills with nine questions given to 22 students, which obtained the highest score of 100 and the lowest score of 26. In the 7 class interval groupings of students whose scores reached the KKM from the interval 68-100, the category that did not reach the KKM was from the class interval 24-67. It can be said that eight students reached the KKM, or around 36%. Meanwhile, those who did not reach the KKM were 14 people or around 64%.

The minimum value obtained for the pretest unit analysis was 15, while the maximum was 85. The mean value was 57.24, the median was 59.26, the mode was 59, the standard deviation was 19.920, and the range value was 70. Meanwhile, the posttest unit analysis value obtained a minimum value of 26. at the same time, the maximum value is 100, the mean value is 63.47, the median is 64.81, the mode is 67, the standard deviation is 17.681, and the range value is 74. The results of the unit analysis can be seen in Table 2 as follows:

Table 2. Analysis of Critical Thinking Ability

Unit Analysis	Pretest	Posttest
Minimum Value	15	26
Maximum Value	85	100
Mean	57.24	63.47
Median	59.26	64.81
Mode	59	67
Standard Deviation	19.920	17.681
Range	70	74

Based on the results of Table 2, it is explained that the scores on the pretest and posttest show that there has been a change in the average score, although only slightly. The average pretest score is 57.24, and the average posttest score is 63.47. Based on the average of the pretest and posttest, there was an increase of 6.23 points. The pretest and posttest normality tests were carried out with Kolmogorov-Smirnov or Shapiro-Wilk using SPSS Statistics v.22 for Windows, which can be seen in Table 3.

Table 3. Pretest and Posttest Normality Test Results

Variable	Sig.	A	Result
Pretest of Critical Thinking Ability	0,254	0,05	Normally distributed
Posttest of Critical Thinking Ability	0,999	0,05	Normally distributed

Based on the results of Table 3, it is explained that there is data that is not normally distributed and that it is normally distributed, which can be seen from its significance or probability. The guideline for decision-making is that if the significant value is <0.05, then the data is not normal, and if the significant value is >0.05, then the data is declared normal. The significant value obtained from the pretest normality test was 0.254 > 0.05. This shows that the pretest critical thinking ability test data results are normally distributed. Meanwhile, the significant value obtained from the posttest normality test is 0.999 > 0.05, so the data is normally distributed.

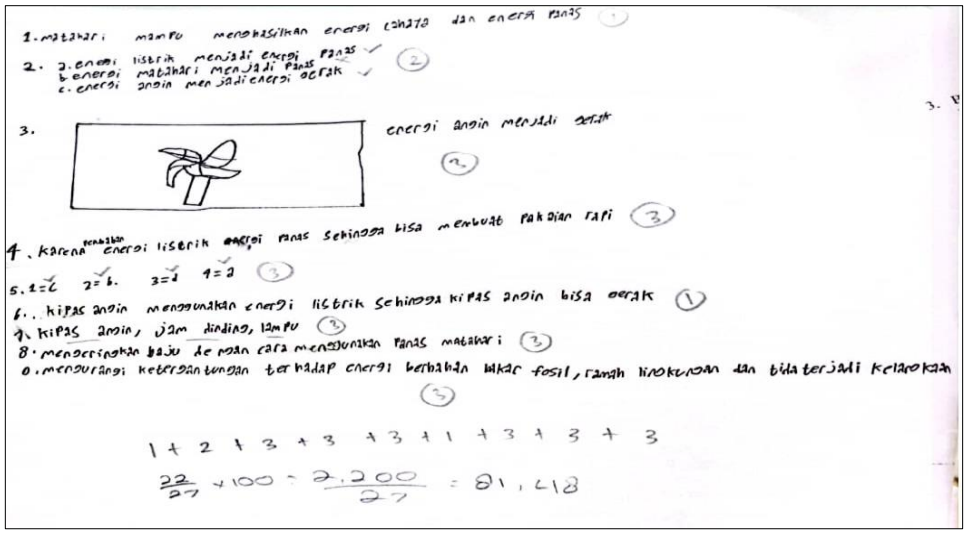
This research used SPSS Statistics software version 22 to assist in hypothesis testing. In this research, a paired sample t-test was used. The paired sample t-test was carried out to test the difference between two paired samples. The results of the paired sample t-test can be seen in Table 4.

Table 4. Paired Sample T-Test Results

Variable	Mean	Std. Deviation	Std. Error Mean	A	Sig.
Pretest-posttest	6,229	15,223	3,246	0,05	0,069

Based on the results of Table 4 it states that there is no significant difference between the pretest and posttest on critical thinking skills. In the pretest, the average obtained was 57.24, while the average in the posttest results was 63.47. So, the average difference between the pretest and posttest is 6.23. The decision-making guideline is if the significant value of Sig. (2-tailed) < 0.05, then there is a significant difference between the pretest and posttest on students' critical thinking abilities, or Ho is rejected, and Ha is accepted. If the significant value of Sig. (2-tailed) > 0.05, so there is no significant difference between the pretest and posttest on students' critical thinking abilities or Ho is accepted and Ha is rejected. Sig significant value. (2-tailed) obtained is 0.069 > 0.05, so Ho is accepted, and Ha is rejected, or the data states that there is no significant difference between the average pretest and posttest of students in the lecture and question and answer method assisted by video learning media on students' critical thinking

abilities. class IV A Muhammadiyah Islamic Elementary School Klaseman.



Picture 2. Results of student work on the critical thinking skills test

Figure 2 shows the results of students' work doing critical thinking ability test questions, which the teacher gives as a *pretest and* posttest to determine students' critical thinking skills on the material given. Furthermore, the average student's critical thinking skills score was obtained: the pretest score was 57.24, and the average posttest score was 63.47. The average score on the student's critical thinking skills test increased from 57.24 to 63.47. Based on the data processing results that have been carried out using t-test statistics, obtained is 0.069 > 0.05 to show that H_o's hypothesis is accepted and H_a is rejected. From the analysis results, it can be concluded that the use of lecture and question-and-answer methods assisted by video learning media does not affect improving students' critical thinking skills in science subjects. The test results showed that students with good category scores were 32%, and students with poor category scores were 68%.

According to research by Khulalil & Tyasmiarni (2021) on the title of the influence of the lecture method on learning outcomes in class I mathematics lessons at SDN Telang 1, from the results obtained when working on questions, students do not understand what the teacher conveys in receiving learning; therefore students do not understand the learning carried out by the teacher. The solution to the problem of the influence of the lecture model on learning outcomes is to use a more effective learning model and use concrete objects in the form of media or teaching aids, such as an abacus so that the problems students receive from the teacher can be resolved. In Setyowati & Suprapti's (2022) research, factors inhibiting the ability to think

reflectively or critically include requiring a long time for preparation and implementation in thematic learning, such as preparing lesson plans, creating HOTS-based questions and evaluation questions, adapting to learning media or delivery of material. In research by Purbarani et al. (2018), it was explained that based on interviews with class teachers, student's ability to think critically was still relatively low, students' ability to solve problems during the learning process was still lacking, and curiosity was still low. They pay less attention to the teacher's explanations, joke with their friends, make noise in class, are busy playing alone and lack concentration on the lesson. Apart from that, most students immediately take information at face value without first considering whether their data is credible. According to Trimahesri and Agustina (2019), the level of critical thinking is still low due to the application of learning models that are less innovative and learning that does not use basic concepts by relating realistic problems. This statement aligns with the opinion of Anugraheni (2018), who states that developing students' critical thinking skills requires a learning process that involves students actively, especially in the learning process in the classroom.

Figure 3. The learning process uses the lecture and question and answer method with the help of video learning media

Based on Figure 3. The teacher applies the lecture and question and answer method assisted by video learning media in class IV science subjects. Based on research, the application of the lecture and question and answer method is a method that is not appropriate to use with the help of video learning media. In research, Pabesak and Santoso (2023) stated that the duration of using the lecture method needs to be reduced because students have limited focus on listening. Teachers must consider several things when implementing the lecture and question-and-answer method. First, the lecture method must be combined with other methods. Second, the lecture method must be accompanied by supportive delivery so students are more

interested in participating in the learning process. Third, use lesson learning media appropriate to the material because students need concrete learning media. Finally, deliver the material using a storytelling approach so students can remember and understand the story more easily. Based on research conducted by Prasetyo (2021), one model that can be applied to science learning is the jigsaw learning model because the application of the jigsaw learning model to science concept material shows a significant increase in learning outcomes with 60% of students get high learning outcomes and 40% of students get medium learning outcomes.

Critical thinking skills and learning outcomes are two important things for students, but in one lesson, the critical thinking skills and learning outcomes of grade 4 students at SD Negeri Suruh 01 are still low. Each individual's critical thinking ability is different, depending on the training to develop critical thinking (Fakhriyah, 2014). What influences this is students' difficulties due to the lack of variety of learning models applied in these subjects, especially in solving story problems. Learning tends to be teacher-centred, as is the background in research conducted by Gunantara et al. (2014). Based on the results of the research and discussion of the influence of the use of lecture and question-and-answer methods assisted by video learning media on students' critical thinking abilities in class IV science subjects at Muhammadiyah Islamic Elementary School Klaseman, there has been a change in the results of the scores on the pretest and posttest; it appears that there has been a change in the average score, although only a few. The average score of students' critical thinking ability tests increased from 57.24 to 63.47. Based on the results of data processing that has been carried out using the t-test statistic, the result obtained is 0.069 > 0.05, indicating that the hypothesis Ho is accepted and Ha is rejected. The analysis results show that using lecture and question-and-answer methods assisted by video learning media does not affect improving students' critical thinking skills in science subjects.

CONCLUSION

The effect of using lecture and question and answer methods assisted by video learning media based on analysis can be concluded that the critical thinking ability of grade IV students in science subjects before or after using video learning media, namely there is a difference in critical thinking skills but not significant. So, it can be concluded that video learning media does not significantly influence students' critical thinking skills in grade IV science subjects. Second, applying lecture and question-and-answer methods assisted by video learning media effectively

impacts MI Muhammadiyah Klaseman students in class IV science subjects. This condition can be proven through the results of the hypothesis test and the critical thinking ability test answers on the *post-test*, which have an average of 63.47, higher than the *pretest average of 57.24.* It is expected through this research, especially for teachers, to increase innovation and creativity in learning. Creating new ideas, using learning methods that are in accordance with the material and using interesting learning media to create a pleasant learning atmosphere and not burden students in class so that students can know the meaning of the lesson delivered. Through this research, schools are expected to provide facilities to teachers in the media and support in making media because learning media plays an essential role in determining learning objectives. In addition, the use of appropriate methods also needs to be considered in learning because using techniques that do not follow the material will be more difficult for students to understand.

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