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The Effectiveness of Problem-Based Learning Model Assisted by Interactive Video in Improving Science Literacy of Students in Elementary School

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Abstract

Science learning in elementary schools requires competent teachers and adequate learning facilities. This study aims to analyze the effectiveness and determine the responses of teachers and students to the application of the interactive video with PBL model in improving the scientific literacy of fifth-grade elementary school. This study used a quasi-experimental research design. The samples of this study were 18 students of class V SD Lerep 02 as the experimental class, and class V SDN Lerep 05 as the control class as many as 21 students. Data were collected using interview techniques, questionnaires, observations, and scientific literacy tests. Data analysis techniques using descriptive test, paired test, N-gain, independent t-test, and response analysis were also carried out to determine student and teacher responses to the applied learning model. The results of this study indicate that 1) the application of the interactive video with PBL model is effective in improving the scientific literacy of fifth grade elementary school students. These results are shown by the experimental class scientific literacy results which are significantly higher than that of the control class with an average value of 84.22% and the results of observations show that 60% of students in each post-learning scientific literacy can increase. 2) Students gave a very good response to the application of the interactive video with PBL model with an average response score of 87.22%. So, it can be concluded that the PBL learning model assisted by interactive video is effective in improving scientific literacy of students in elementary school.

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INTRODUCTION

Learning in elementary school covers all subjects. Learning in elementary school is directed to be able to prepare students to master various subjects at the next level. According to Bukuri (2018), student achievement in a field of study at a high school level is much influenced by the experience of students while studying in elementary school, including learning science. Science subject in elementary schools includes integrated science and basic science for the next level of science learning. Science subject in elementary schools is the budding of science knowledge to an advanced level (Wipradnyana, 2018). Therefore, competent educators and adequate facilities are needed to provide a basic understanding of science learning (Setiyadi, Aviari & Berliana, 2022).

Every learning must have a learning goal. Damanik (2019) explain that teacher competence will greatly determine the success of students in achieving learning goals. Therefore, there have been many socializations of special supplements for elementary school teachers to make them more professional. Budiman, Sabaria & Purnomo (2020) said that one of the supplements provided by education providers is the strengthening of technology. It aims to equip teachers to be able to utilize technology as much as possible in learning activities (Setiyadi, 2019). The curriculum in Indonesia is currently in the process of refinement in order to prepare students' competencies in facing the era of global technological advances (Santika, 2021).

Technology brings various conveniences to all sectors of life. Industrial revolution 5.0 is predicted to develop 10 years faster than the predictions of technology experts (Basuki, 2018). Education with technological transformation needs to be prepared early on (Syamsuar & Reflianto, 2019). One of the contributions of education in welcoming the rapid development of science and technology is the mastery of science. According to Hidayatullah (2019), science is the knowledge that is obtained using various scientific procedures in carrying out various activities and with certain patterned or regular procedures.

The pattern of scientific work can be in the form of describing, securing, classifying, measuring, describing, investigating, experimenting, and comparing. The scientific procedure consists of a series of orderly steps, which generally take the form of determining the problem, formulating hypotheses, collecting information, deriving conclusions, and testing results (Hidayatullah 2019). To achieve knowledge, a curriculum is needed that directs science into a separate subject taught since elementary school, namely Natural Sciences. Science is the science of natural phenomena that is poured in the form of facts, concepts, principles, and laws that have been examined for truth. On the other hand, according to Jannah & Atmojo (2022), science learning in elementary schools teaches how nature is created with a mechanism and structure, with the simplest pattern. This is stated in the 2013 curriculum guidelines regarding the purpose of learning science in elementary schools, namely students are able to do and discover something about the natural surroundings. Therefore, according to Setiawan (2019), science learning must be delivered in the right way and facilitated by the latest technology so that the two main objectives according to the curriculum recommendations can be achieved, namely the concept of doing and discovering natural knowledge, and adapting technology from an early age.

Experience in learning becomes an important point in the level of student understanding of learning. Karli (2018) explain that the concept of understanding science in elementary schools is contained in scientific literacy. Scientific literacy is one of the keys to facing various challenges at this time. Science literacy among fifth-grade elementary school students is very low. Based on the results of observations at SD Negeri Larep 02, the results of scientific literacy of students are 42% (which is relatively low). According to Hanggara, Arofah, & Andrianie (2020), this is often considered normal when students are still in

elementary school, but this condition must be addressed immediately.

Each student has different literacy abilities. Efendi & Barkara (2021) revealed that some criteria indicating students with literacy skills are 1) Students are able to solve problems using scientific concepts, 2) Students are familiar with technological products and can maintain them. 3. Students are creative in creating technological products. Fuadi, Robbia, Jamaluddin, & Jufri (2020) found that by referring to the scientific literacy data released by PISA, it is illustrated that the ability of Indonesian students to compete at the international level still needs to be improved. Even in recent periods, Indonesia has been at a lower level than other countries. This shows that the scientific literacy ability of students in Indonesia is still very low when compared to other countries.

Learning is directed to go hand in hand with technology. So that students can adapt technological developments to learning in the classroom (Nurjannah & Setiyadi, 2022). Technology is not only used as entertainment and communication but can facilitate students in learning process dalam pembelajaran di dalam kelas (Salsabila, Lestari, Habibah, Andaresta & Yulianingsih, 2020). Therefore, it can be said that today's information technology has become a basic need of all people.

Along with the advancement of science and technology, the development of information technology is very rapid, so it requires wise management by educators. Jamin (2018) describes technology as a scientific discipline that should be mastered by teachers and students as a provision in the learning process and their lives. According to Puspitasari (2019), one of the implementations of technology in learning is the use of various electronic media as learning media.

Learning media is a means or intermediary for materials and students so educators must process them in a strategic way so that they are understood and ready to be used by students. Based on teaching observations in elementary schools, it was identified that learning media that used technology had not been widely applied. Meanwhile, students are very enthusiastic about acquiring knowledge with technology-based media.

According to Setiyadi, Munjaji & Naimah (2022), some teachers use gadgets to support learning so as to make students more enthusiastic. Worang, Rantung, & Parinsi (2021), said that multimedia consists of two words derived from Latin, "multi" (which means many) and "medium" (which means something that is used to give). Interactive multimedia is a solution in making it easier for students to learn the material compared to monotonous textbooks. According to Oktafiani, Nulhakim, & Alamsyah (2020), the selected interactive multimedia is a medium to convey information and knowledge that is practically accessible. Setiyadi (2020) stated that the equipment needed is also simple and easy.

Interactive multimedia that is applied is video-based interactive multimedia. This is because the school has available supporting facilities in the form of active speakers in every room, projectors, and even computers or laptops. According to Setiyadi, Rohyana & Muttaqin (2022), this certainly makes it easier for educators to implement video-based multimedia. According to Nua, Wahdah & Mahfud (2018), the PBL model is a learning model designed with problems as a reasoning trigger for students. With the problems faced by students, critical thinking patterns will be formed as a solution to the problems presented (Shofiyah & Wulandari, 2018).

Class V is dominated by students with an age range of 11-12 years. According to Erviana (2019), at that age, students already have mature reasoning for information. Munjiat (2018) believed that at the age of 10-12 years, students are facing a transitional stage from childhood to early adolescence which is a condition where the growth and development of students will experience many changes. Septianti & Afiani (2020) argued that the characteristics of students that affect the process and learning outcomes are intelligence, initial abilities, cognitive styles, learning styles, motivation, and socio-cultural

factors. Information about the level of development of students' intelligence is needed as a basis for choosing components in learning, such as learning objectives, materials, media, learning strategies, and evaluation. Siang et al. (2020) also added that it can be based on consideration of thinking skills and the challenges of designing interesting learning, including scientific literacy.

This is considered important because currently scientific literacy is needed in various aspects of scientific development. Meanwhile, based on the observations of researchers in several elementary schools in Semarang Regency, they stated that scientific literacy skills were still low, indicated by students tended to be able to solve science literacy questions at level 1. Putri (2022) proposed that scientific literacy can open students' horizons about natural science in everyday life. Scientific literacy which is considered difficult by students and educators will be solved by applying interactive multimedia in PBL model. The results of the study prove that problem-based learning in scientific literacy is very important. Students will be motivated to learn about existing problems. PBL with the support of the right video media can increase student curiosity about the material being taught.

PBL that is implemented using interactive learning videos can stimulate students to be more critical in thinking about solving problems. According to Setiyadi, Fortuna, & Ramadhan, (2022), students are faced with scientific problems presented in the video and are active, critical, and solution-oriented in responding to these problems. With the videos that are equipped with instructions, it can make it easier for students to be active and understand the designed learning flow. This is in line with the results of research by Hanim, Susilo & Yuliati (2020), that shows a positive correlation between PBL and scientific literacy. Furthermore, Widiawati, Susongko, & Widiyanto (2019) showed that the problem-based learning model (PBL) was effectively applied as an alternative to learn science literacy and was proven to show an optimal increase in scientific literacy skills.

Based on the explanation above, the purpose of the study is to analyze the effectiveness and determine the responses of teachers and students to the application of the interactive video with problem-based learning (PBL) model in improving the scientific literacy of fifth-grade elementary school students. This research can be used as a reference for developing innovative learning media and a reference for providing more adequate learning facilities.

METHODS

This study used a quasi-experimental research design. The population in this study were fifth-grade elementary school students in West Ungaran District, Indonesia. The samples of this study were 18 students of class V SD Lerep 02 as the experimental class, and class V SDN Lerep 05 as the control class which 21 students in total. The sampling technique used was simple random sampling. Data were collected using interview techniques, questionnaires, observations, and scientific literacy tests. The data analysis technique used descriptive test, paired test, N-gain, and independent t-test test to determine the effectiveness of the PBL learning model with interactive video in improving the scientific literacy of fifth-grade elementary school students, response analysis was carried out to determine student and teacher responses to the learning model. The research design is as shown in Table 1.

Table 1. Experimental Design from Non-Equivalent Control Group Design

Class	Pretest	Treatment	Posttest
E	O1	X1	O2
K	O1	X2	O2

Note:
E : Experimental Class
K : Control Class
O1 : Pretest
O2 : Posttest
X1 : Interactive Video with Pbl Model
X2 : Learning Method

Furthermore, Prerequisite Test Results Can Be Seen In Table 2

Table 2. Prerequisite Test

Test	Score	Signs.	Results
Normality Test	0.672	0.05	Normal data
Homogeneity Test	0.131	0.05	Homogeneous data

RESULTS AND DISCUSSION

The Effectiveness of the PBL Model assisted by Interactive Video in Improving Science Literacy for Class V Elementary School Students

Descriptive Analysis

In general, descriptive scientific literacy data for experimental and control class students is presented in Table 3.

Table 3. Descriptive statistics

Class		N	Max	Min	Average	Stands. Dev
Experimental Class	O1	18	20	60	45.56	11.97
	O2	18	64	100	84.22	8.94
Control Class	O1	21	16	68	35.62	12.89
	O2	21	44	72	59.62	6.80

Note:
O1 : Pretest ; O2 : Posttest

Differences in scientific literacy abilities, the following is a graph of the increase in the percentage of students who answered correctly at each level of science literacy questions in Figure 1.

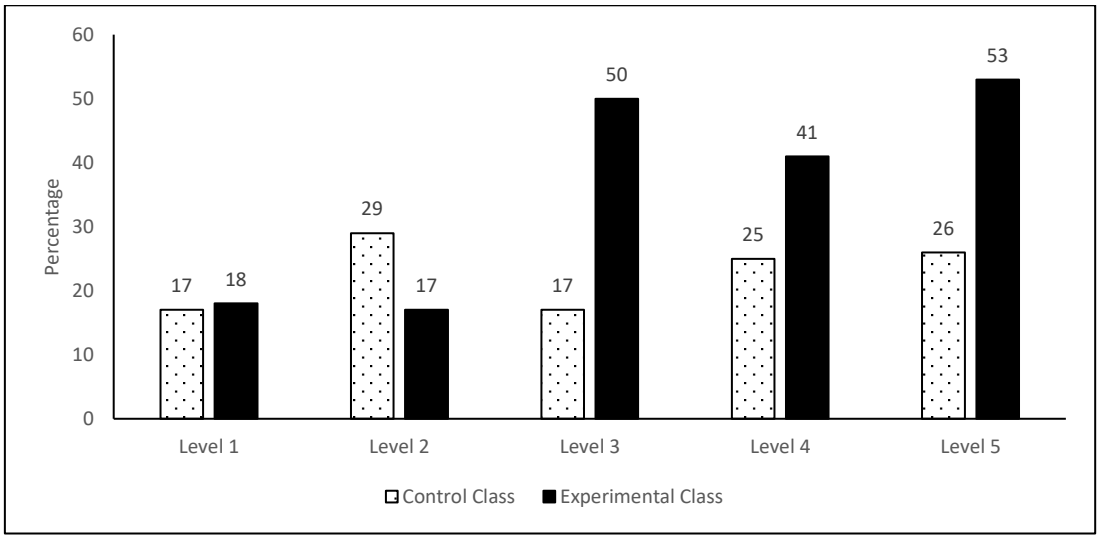


Figure 1. Percentage of Increasing Science Literacy Ability

Based on Figure 1, it can be seen that the percentage increase in scientific literacy ability levels 3,4,5 in the experimental class has increased higher than in the control class with an average of 48%. As for level 1, the increase in the control and experimental classes is almost the same, with only a difference of 1%. For level 2 the increase in the control class was 12%

higher than in the experimental class. However, the percentage of correct answers is always higher in the experimental class than in the control class. The experimental class science literacy scores at the pretest level 1 and 2 were already above 50% while the control class was still below 50%, so the increase in the control class at level 1 looks almost the same and at level 2 looks higher.

Completeness Test

Based on completeness test for the student's scientific literacy, it can be seen that of the 18 experimental class students, there were no students who completed the Minimum Completeness criteria (KKM) in the pretest data, and 17 students (94.4%) completed the KKM in the posttest data. The scientific literacy of students in the control class can be seen that of the 21 control class students, there were no students who have completed the KKM in the pretest data, and there are 2 students (9.52%) who completed the KKM in the posttest data. The following are the results of scientific literacy in the experimental class and the control class.

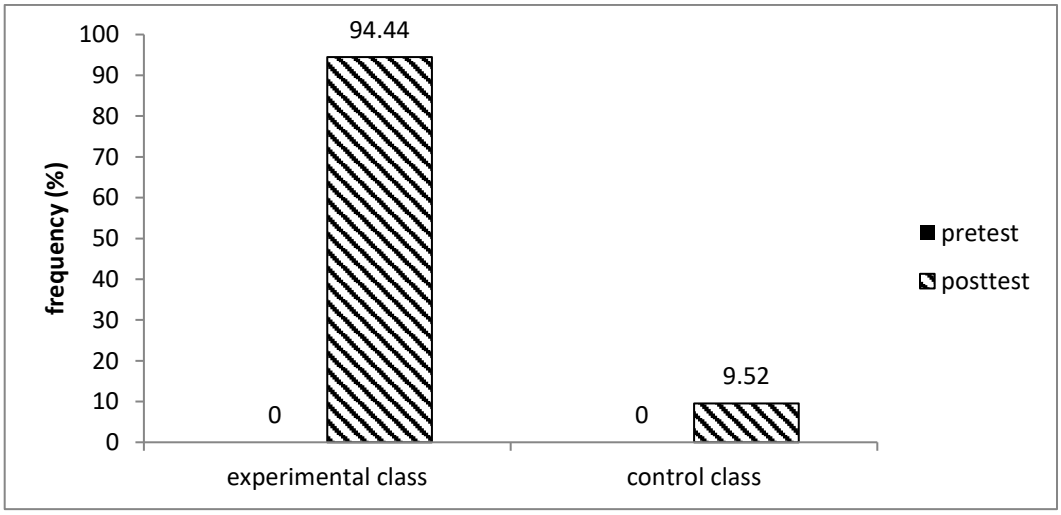


Figure 2. Student Science Literacy Ability

Paired Test

The test for increasing scientific literacy of students using interactive video with PBL model used a paired-sample test with the following hypotheses:

$H_0: \mu_1 = \mu_2$(There is no difference in students' scientific literacy before and after learning in the experimental class/control class)

$H_1: \mu_1 \neq \mu_2$ (There are differences in students' scientific literacy before and after learning in the experimental class/control class)

This paired test is carried out with the test criteria, namely accept Ho if Sig > 0.05. The results of the N-gain test can be seen in Table 4.

Table Error! No text of specified style in document.**.** Paired Test of Student Scientific Literacy

Data	T Count	Sig	Results
Pre-Post Experiment	-13.807	0.000	There is a significant difference
Pre-Post Control	-8.445	0.000	There is a significant difference

Based on the difference test with SPSS 20 with a paired sample test is found that the significant value of the control class and the experimental class is 0.000 <0.05, then Ho is rejected. This shows that there are differences in students' scientific literacy before and after being given treatment. In conclusion, there is a significant increase in students' scientific literacy

before and after using the interactive video with PBL model in the experimental class and there are differences in students' scientific literacy before and after the application of the conventional learning model in the control class. Although the control class and the experimental class both had a significant increase, the average increase in students' scientific literacy was different, as shown in Figure 5.

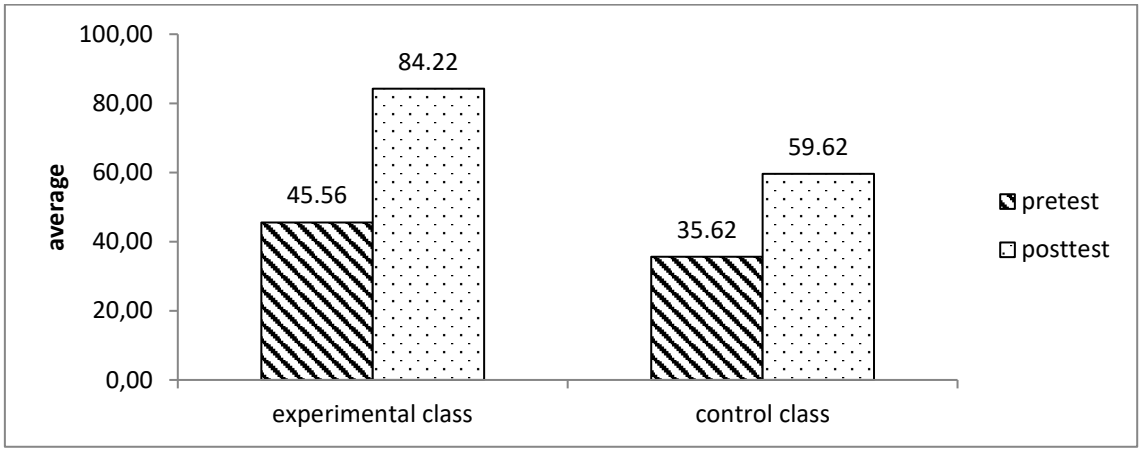


Figure 5. Average Score For Students' Science Literacy

Based on Figure 5, this shows that the experimental class experienced an increase in the average score, which was higher (84.88%) than the control class (which was only 67.38%).

N-Gain Test

The N-Gain test was conducted to see the difference between the students' pretest and posttest scores. N-Gain analysis, the increase in students' scientific literacy can be classified based on the category of low, medium, and high improvement so that it can be seen the level of effectiveness of the application of interactive video with PBL model. The results of the N-Gain analysis are described in Figure 6.

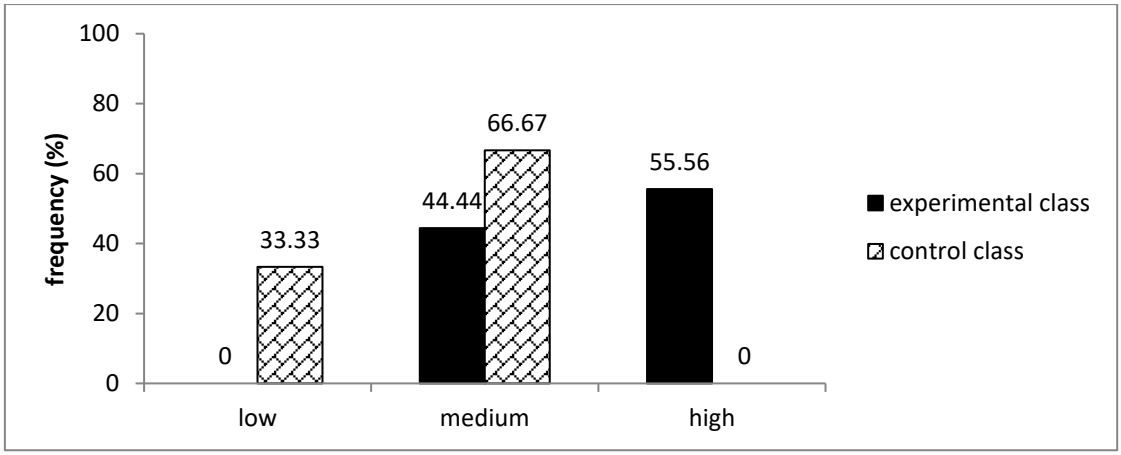


Figure 6. Graph of N-Gain Frequency Distribution of Students' Science Literacy

The average N-Gain in the scientific literacy data of experimental class students is 0.709 (in the high category), while the control class has a lower N-Gain value of 0.36 (in the medium category). This shows that the increase in scientific literacy of the experimental class students using the interactive video with PBL

model is more effective than the control class using conventional method.

Comparative Test

Comparative testing was used to determine the difference in the average scientific literacy of students who followed the interactive video with PBL learning model compared to students who took lessons using conventional learning method. Comparative testing in this study was conducted using an independent t-test and the hypotheses used were:

$H_0: \mu_1 = \mu_2$(There is no difference in scientific literacy of control class and experimental class students)

$H_1: \mu_1 \neq \mu_2$(There are differences in scientific literacy of control class and experimental class students)

The test criteria are to reject Ho if t count > t table or Sig value <0.05. The results of the independent sample t-test in this study showed sig. of 0.000 <0.05, which means that there is a difference in the average posttest value of students' scientific literacy between the control class and the experimental class. Because there was a significant difference between the control class and the experimental class, further testing was carried out by looking at the average posttest value.

The post-test average of the experimental class was 84.22 and the control class was 59.6, so it can be concluded that the average scientific literacy value of the experimental class students was higher than the control class after learning. Based on the results of previous tests, the interactive video with PBL model can increase the completeness and average of scientific literacy at a moderate level and has a higher average score than the control class. Thus, the application of the interactive video with PBL model can improve scientific literacy for the fifth-grade elementary school students effectively. The interactive video can be seen in Figure 7 and Figure 8. While the results of the pretest and posttest can be seen in Figure 9 and Figure 10.

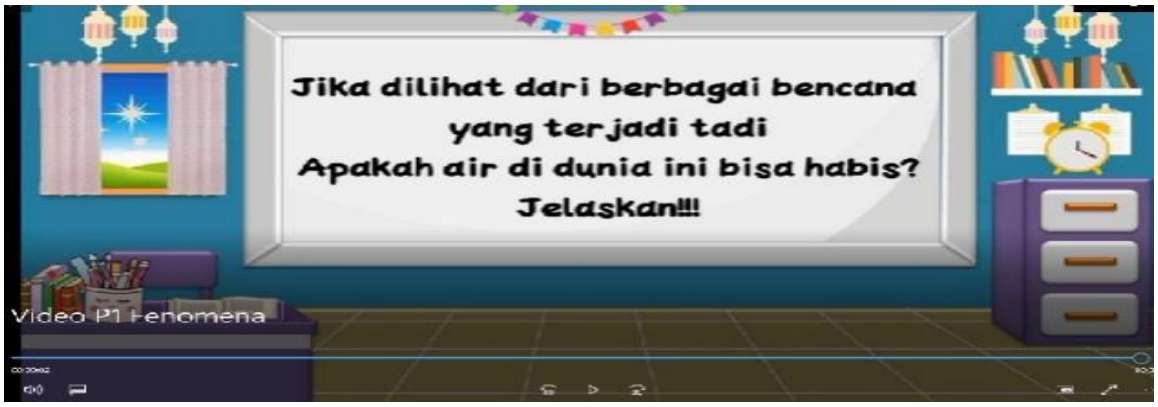
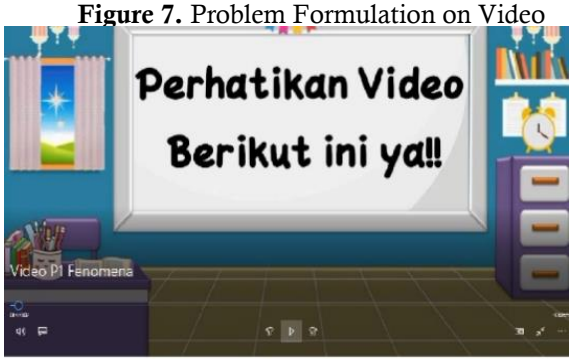


Figure 7. Problem Formulation on Video



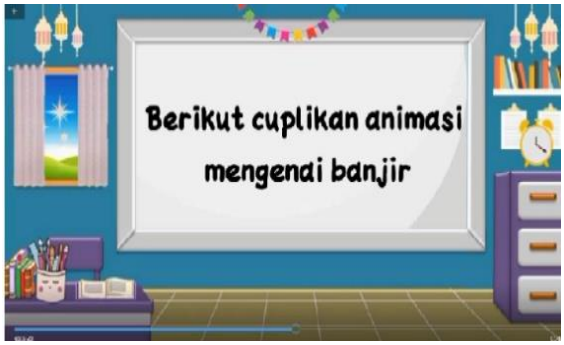
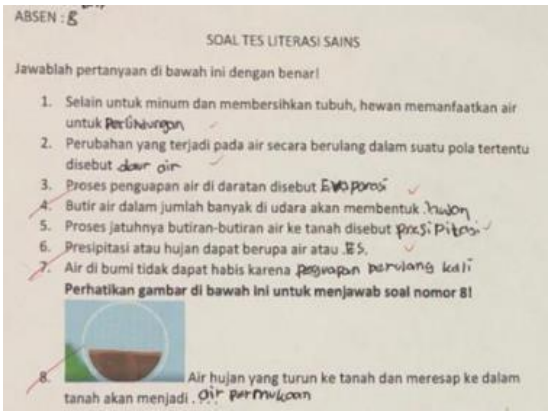


Figure 8. Water Cycle Interactive Video


ABSEN : 8

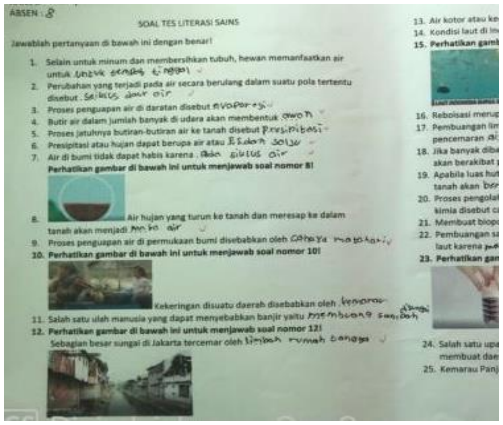
SOAL TES LITERASI SAINS

Jawablah pertanyaan di bawah ini dengan benar!

1. Selain untuk minum dan membersihkan tubuh, hewan memanfaatkan air untuk Perlindungan
2. Perubahan yang terjadi pada air secara berulang dalam suatu pola tertentu disebut daur air
3. Proses penguapan air di daratan disebut Evaporasi
4. Butir air dalam jumlah banyak di udara akan membentuk hujan
5. Proses jatuhnya butiran-butiran air ke tanah disebut Presipitasi
6. Presipitasi atau hujan dapat berupa air atau Es.
7. Air di bumi tidak dapat habis karena Penguapan berulang kali

Perhatikan gambar di bawah ini untuk menjawab soal nomor 8!

8. Air hujan yang turun ke tanah dan meresap ke dalam tanah akan menjadi . air permukaan


ABSEN : 8

SOAL TES LITERASI SAINS

Jawablah pertanyaan di bawah ini dengan benar!

1. Selain untuk minum dan membersihkan tubuh, hewan memanfaatkan air untuk [illegible]
2. Perubahan yang terjadi pada air secara berulang dalam suatu pola tertentu disebut . Siklus daur air
3. Proses penguapan air di daratan disebut evaporasi
4. Butir air dalam jumlah banyak di udara akan membentuk awan
5. Proses jatuhnya butiran-butiran air ke tanah disebut Presipitasi
6. Presipitasi atau hujan dapat berupa air atau Es atau salju
7. Air di bumi tidak dapat habis karena . Ada siklus air

Perhatikan gambar di bawah ini untuk menjawab soal nomor 8!

8. Air hujan yang turun ke tanah dan meresap ke dalam tanah akan menjadi mata air
9. Proses penguapan air di permukaan bumi disebabkan oleh [illegible]

10. Perhatikan gambar di bawah ini untuk menjawab soal nomor 10!

Kekeringan disuatu daerah disebabkan oleh kemarau

11. Salah satu ulah manusia yang dapat menyebabkan banjir yaitu membuang sampah

12. Perhatikan gambar di bawah ini untuk menjawab soal nomor 12!

Sebagian besar sungai di Jakarta tercemar oleh limbah rumah tangga

13. Air kotor atau ke
14. Kondisi laut di
15. Perhatikan gamb
16. Reboisasi menu
17. Pembuangan lin pencemaran di
18. Jika banyak dib akan berakibat
19. Apabila luas hut tanah akan ber
20. Proses pengola kimia disebut
21. Membuat biop
22. Pembuangan s laut karena
23. Perhatikan ga
24. Salah satu up membuat dan
25. Kemarau Pan

Analysis Results of Student Science Literacy Observation

The results of the effectiveness of the application of interactive video with PBL model to increase the scientific literacy of fifth-grade elementary school students are also strengthened by the results of observations. The results of observations regarding students' scientific literacy after learning in the experimental class are presented in Table 5.

Table 5. Frequency Distribution of Students' Science Literacy Observations After Learning

Indicator	Look	Invisible
Motivation of students in learning	100	0
Critical thinking skills during the learning	83.33	16.67
Ability to discuss using arguments	88.89	11.11
Ability to describe problems in discussion	88.89	11.11
The ability to mention scientific terms in the learning that is followed	88.89	11.11
Ability to participate actively and responsively in science learning activities	61.11	38.89

Based on the results of the analysis in Table 5, it can be seen that more than 60% of students were recorded as appearing in each post-learning scientific literacy observation indicator. This shows that the application of interactive video with PBL model can improve students' scientific literacy which then has a positive impact on students' self-efficacy, such as increasing learning motivation, critical thinking skills, discussion skills, problem-solving, and being able to actively participate in learning.

Another study on scientific literacy was developed by Pertiwi, Atanti & Ismawati, (2018), that the importance of scientific literacy and developing media to improve students' ability in scientific literacy. This type of development research produces data in the form of presentations on increasing scientific literacy by students with a range of 49% - 54%, in the functional category in the percentage range of 34% - 44%, and a small portion in the procedural category, namely 2%.

According to Sekawinahyu (2019), the implementation of an authentic e-portfolio assessment based on a web blog that was developed can effectively improve the critical character of students. Every aspect of students' critical character indicators has increased. Overall, the increase (gain) of students' critical character is 0.83 which means the increase is with high criteria. According to Fattah, A., & Suhirman, S. (2019), scientific literacy at any level is still important to improve. Wardani & Syofyan (2018) produced a learning media in the form of interactive Video with the results of the media effectiveness t-arithmetic test (6.32) > t table (2.05) which means it is effective to be applied in learning.

The implementation of the interactive video with PBL learning model for fifth-grade students at SD Negeri Lerep 02 is applied to science subjects. According to Sriyati, Ivana & Pryandoko (2021), PBL is a potential model for the achievement of students' scientific process abilities as a result of the problem-solving process so that students' scientific literacy can increase. This can be seen from the results of the paired t-test which shows the value of sig. of 0.00 < 0.05 which means that the PBL learning model assisted by interactive video has a significant influence on students' scientific literacy and there is an increase in students' scientific literacy by 85% of the pretest results.

These results are reinforced by the average N-Gain value of 0.709 which indicates that the increase in scientific literacy of students is effective in the high category, and 67% of students have experienced an increase in scientific literacy in the high category of post-learning. These results are in line with research conducted by Octavyanti, & Wulandari (2021) that media-assisted PBL learning that displays images, videos, sounds, and moving images can significantly improve students' scientific literacy. Students' literacy skills have increased with the PBL model with an increase in the moderate category (Pamungkas & Franita, 2019).

The use of media that can display moving images and sounds such as in e-module can improve students' scientific literacy skills because it makes students more independent and more active in participating in learning (Arifin & Herman, 2018). Student learning activities increase at each meeting because of improvement efforts from students to be better than the previous meeting after implementing PBL learning assisted by interactive video (Rohim et al, 2020).

The results of other studies also show that there are significant differences in scientific literacy and concept understanding of students with the PBL model and students with lecturing method (Fufu, 2019). According to Sumarni, Wijayati, & Supanti (2019), learning that applies case science can improve students' ability to solve problems and problem-based learning can also develop students' skills. Setiyadi, Zaenuri, & Mulyono (2018) reveaked that students with PBL model are trained to be able to think about solving problems, because PBL synthesizes learning that is organized into a problem so that it can familiarize students to understand concepts and be active in solving a problem by constructing their own knowledge.

This is evident in the results of the observation of post-learning students' scientific literacy skills. According to Widyaningtyas, Wiyanto & Nuswowati (2021), students become visible or increase learning motivation, and critical thinking skills, and can actively participate in learning. Nisa, Sarwi & Subali (2021) explained that PBL also produces outputs in the form of increasing students' creative thinking skills in describing problems in learning.

Analysis of Teacher and Student Responses to the Application of Interactive Video with PBL Model

The results of the analysis of student responses to the application of the interactive video with PBL model were analyzed using descriptive percentages, it was presented in Table 6.

Table 6. Distribution of Student Response Frequency on Each Indicator

Indicator	Score (%)	Category
The teacher conveys the material easily and clearly	98.61	Very good
The teacher gives examples of varied learning	88.89	Very good
The teacher uses easy steps in learning	86.11	Very good
Teachers use interesting learning media	87.50	Very good
The teacher conveys the material in a fun way	84.72	Very good
The teacher explains the problems of nature clearly	84.72	Very good
The teacher gives assignments according to the material presented	88.89	Very good
The tasks given are easy to understand	86.11	Very good
Learning about the water cycle is fun	79.17	Good
It's easier for me to learn about the water cycle with interactive videos	87.50	Very good
Average	87.22	Very good

Based on the results of the analysis in Table 6, in general, students gave a very good response to the application of the interactive video with PBL model with an average score of 87.22%. Students also gave a very good response when the teacher delivered the material, students felt that the material was easy and clear to understand.

Students also respond very well to teachers who provide varied examples of learning, provide easy and clear understanding steps, and the tasks given are in accordance with the material presented. In addition, students are also very interested when learning using interesting media such as interactive videos. It will be easier for students to learn about the water cycle.

Furthermore, the results of the teacher response analysis showed that the teacher felt very helpful with the interactive video with PBL model because there were videos that had explained the material, so the teacher played a role in reaffirming. Learning also becomes more interesting and children are more enthusiastic, pay more attention to the material, and are interested in discussing solving existing problems (Rahayu & Setiyadi, 2022). The teacher also gave a response that students' scientific literacy also improved for the better, because the material in the questions given was already contained in the video that was played.

The application of the interactive video with PBL model has proven to be effective in improving students' scientific literacy, to strengthen these results, student and teacher responses during the learning process are needed. Student and teacher responses were taken after the application of the interactive video with PBL model was completed. The results showed that students gave a very good response to the application of the interactive video with PBL model with an average score of 87.22%.

Students feel that the teacher has conveyed the material clearly and easily and the tasks given are in accordance with the material presented, so that students feel they can be very good at completing the task. This is partly due to the use of interactive videos in PBL model. According to Ilmiani et al., (2020), the use of video in learning has the power and can visualize concepts to students easily and

interactively compared to learning that only uses ineffective textbooks. Furthermore, Arfiani (2022) believed that the advantages of implementing the PBL model in learning are that students are encouraged to participate actively, students are able to integrate knowledge, students are able to solve problems, and learning becomes more meaningful.

Janah et al (2019) stated that teachers also find it very helpful to have an interactive video with PBL model, because there are videos that have explained the material so that the teacher has a role to reaffirm. This is confirmed by Utami & Dewi (2020) that the use of interactive teaching materials can require teachers to use information and communication technology in learning so that it can increase students' learning motivation compared to only using the lecturing method (Rikawati & Sitinjak, 2020). The teacher also felt that students became more enthusiastic when using interactive videos were used in learning, and students became more aware of the water cycle. Besides, students were more active in answering and asking questions in discussions. Therefore, students and teachers gave a positive and very good response to the application of interactive video with PBL model.

CONCLUSION

The results showed that students' scientific literacy also experienced a significant increase of 85% which was included in the moderate level of effectiveness. The results of the comparative test also show that the scientific literacy of the experimental class is significantly higher than the control class with an average value of 84.22 and the results of the observations also show that 60% of students are listed as appearing on every indicator of post-learning science literacy observation. It can be said that the application of the interactive video with PBL model is effective. Students gave a very good response to the application of the interactive video with PBL model with an average response score of 87.22%. Students gave a very good response when the teacher delivered the material and students felt that the material was easy and clear to understand with interactive videos. Teachers also feel very helpful with the PBL model assisted by interactive videos because the video explains the material and provides questions so that the teacher has a role to reaffirm. The teacher also emphasized that students felt interested and happy during science learning, therefore students could improve their scientific literacy.

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