



Application of Problem-Based Learning with Video Assistance to The Learning Outcomes of Science from Students in Class V Elementary School

GUSMAWETI^{a*}, Rigel Prima SARI^b, ENJONI^c

^{a*}*Biology Education Study Program, Universitas Bung Hatta, Padang, West Sumatra, Indonesia*

^{bc}*Elementary School Teacher Education Study Program, Universitas Bung, Padang, West Sumatra, Indonesia*

*Corresponding author: gusmaweti1960@gmail.com

Abstract

This study aims to determine the effect of the video-assisted Problem-based learning (PBL) model on cognitive and psychomotor aspects of learning outcomes in the question-and-answer indicators in science learning for Class V students at SD Negeri 31 Payakumbuh. This type of research is an experiment with a "posttest-only control design". The population in this study were all fifth-grade students at SD Negeri 31 Payakumbuh for the 2022/2020 academic year. The sampling technique is Total Sampling. The research instrument was in the form of valid, reliable student science learning test questions, and student learning questionnaires on psychomotor aspects. Data on student learning outcomes were analyzed using the t-test at the 5% test level. The results showed that there was a significant effect of the Video Assisted Problem Based Learning Model on Science Learning Outcomes of Class V Students, in a statistical test $t_{hit} > t_{tab}$, namely $2.30 > 2.01$. the average cognitive aspect of learning outcomes in the experimental class was 82.43 and in the control class 73.03. The science learning outcomes of students in the psychomotor aspect on the indicator asking the experimental class were 65.32% and the control was 59.80%, and the indicator answering the experimental class was 83.06% and the control was 75%. It can be concluded that the application of the video-assisted Problem-Based Learning model has an effect on the science learning outcomes of fifth-grade students at SD Negeri 31 Payakumbuh in the 2022/2023 Academic Year. It is suggested that teachers who teach science in elementary schools can apply the video-assisted Problem-Based Learning model to different science materials to improve the learning process.

Keywords: Model, Problem-Based Learning, video, learning outcomes

Acknowledgments: Thank you to the principal of Payakumbuh 31 Public Elementary School who has given permission to carry out the research.

For citation:

Gusmaweti, Sari, R. P., & Enjoni. (2023). Application of Problem-Based Learning with Video Assistance to The Learning Outcomes of Science from Students in Class V Elementary School. *Journal of Digital Learning and Distance Education*, 1(12), 387-394.

Introduction

In education, of course, there is a teaching and learning process, which is the core of educational activities in schools (Fajri, 2018). Education is a useful long-term investment for the sustainability of human civilization in the world. Education is very important in one's life. Education will determine one's future and direction, although not everyone thinks that way. Law No. 20 of 2003 concerning the national education system reads that the purpose of education is to develop the potential of students to become human beings who believe in and fear God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible. The aim of national education is expected to be able to motivate the nation's next generation so that they are able to compete in the world of education.

The teacher is one of the factors causing success in carrying out learning. The problem faced during the fifth-grade observation conducted at SD Negeri 31 Payakumbuh, West Sumatra is that the teacher has not really mastered how to apply learning models, is less innovative, and is still teacher-centered oriented. The teacher is still dominant in lecturing and does not provide opportunities for students to do question and answer, or discuss with groups, so students do not understand the material taught by the teacher. This problem is the main cause of the failure of learning in class V SD Negeri 31 Payakumbuh. This is shown by the results of the students' midterm exams which are still low, and the number of students who score below the minimum completeness (KKM) is still high (Table 1).

Table 1. UTS Science Scores of Class V Students at SD Negeri 31 Payakumbuh Academic Year 2022/2023

Class	Σ students (person)	complete (%)		KKM
		complete	No complete	
VA	32	65,6	34,4	75
VB	30	46,6	53,4	

Source: Class V grade book at SD Negeri 31 Payakumbuh

Table 1 shows the results of the Mid Semester Examination (UTS) carried out by the teacher, of the total 32 students in the VA class, 34.4% did not complete and the number of VB class students was 30, and 53.4% did not complete. The minimum completeness criterion (KKM) set by the school is 75. In this case, the percentage of students' science learning is still high. In connection with this, it is necessary to improve, especially the learning process, namely by applying a model. innovative learning, which is expected to improve the ability to think creatively, and meaningfully and make students more active in learning, one of which is Problem-Based Learning (PBL).

Hasmiati (2022) it is stated, the problem-based learning model or Problem-Based Learning (PBL) is learning that uses the thinking abilities of students individually or in groups as well as the real environment to solve problems so that they are meaningful, relevant, and contextual. According to Shoimin, (2016), Problem-Based Learning or problem-based learning is a strategy in which students learn through practical problems related to real life or everyday life. Then

students are directed to solve the problems that are being discussed through a series of systematic learning. Thus Problem-Based Learning can optimize student learning outcomes. Problems can be presented through digital formats, for example, videos to clarify complex phenomena so that they can lead students to a more complete mastery of concepts and theories. Videos provide opportunities for students to think freely and more easily imagine problems through audio-visual media. The use of video media also serves to attract students' attention in the learning process as an important component of learning. Video media is an option to support a fun learning process so that it can increase students' understanding of the material being taught. So, it is hoped that the application of the PBL learning model assisted by video media can improve student learning outcomes.

Several studies that have been carried out by previous researchers related to the application of problem-based learning (PBL) which affect science learning outcomes in elementary schools include: by Annisa (2022) on science learning outcomes for Class IV students at SDN Gugus I, Kuripan District; Fitriana (2022) results of learning science for fifth-grade students at Sumur Welut III SDN Surabaya; Amran (2022) a class V UPT SD Negeri 382 Pallawarukka; Swarjana (2021) on Science Learning Outcomes of Class III Cluster VII Elementary School Students in Sukasada District, Buleleng Regency; and Arsyam (2021) on the results of science learning outcomes for fourth-grade students at SD Islam Al Azhar 34 Makassar.

Based on the description stated above, research was conducted on the application of the video-assisted Problem-Based Learning (PBL) model to students' cognitive learning outcomes in the Science subject of Class V students at SD Negeri 31 Payakumbuh. The objectives to be achieved in this study were to determine the effect of the video-assisted Problem-Based Learning model on student learning outcomes in the cognitive aspect and to describe student learning outcomes in the psychomotor aspect in the indicators of asking and answering questions. With this research, the authors hope to be able to provide benefits to the world of education, especially learning in fifth-grade students at SD Negeri 31 Payakumbuh, West Sumatra. and can motivate colleagues that there are many learning models that can be applied to learning.

Method

The type of research used is experimental research. The independent variable in the research was the video-assisted Problem-Based Learning model and the dependent variable in the study was the science learning outcomes of fifth-grade students at SD Negeri 31 Payakumbuh. The research design used was the Posttest-Only Control Design. According to Sugiyono, (2019), The population is the entire object of research. In this study, the population was all fifth-grade students at SD 31 Negeri Payakumbuh for the 2022/2023 academic year, which consisted of two classes, 32 students in the VA class and 30 students in the VB class. The sampling technique was carried out in Total Sampling, meaning that the population was directly sampled. To determine the experimental and control classes were carried out randomly. then obtained the VA class as the experimental class and VB class as the control class.

t test formula:

$$t\text{-count} = \frac{\bar{x}_1 - \bar{x}_2}{S_{combined} \sqrt{\frac{n_1 + n_2}{n_1 \cdot n_2}}} \quad \text{with } S_{combined} = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

Results

Based on research that has been done on the application of the video-assisted Problem Base Learning (PBL) model in class V SD Negeri 31 Payakumbuh. Then the following results are obtained:

Test Results Problem

Based on the results of the test questions conducted at schools that were considered equivalent to the schools where the research was conducted, the data were analyzed for the level of validity of the questions, the level of difficulty of the questions, discriminating power and reliability as shown in (Table 2).

Table 2. Results of test questions

Analysis	Category	Qualification
Validity	0,38 – 0,72	High, Fair, and Low
Tingkat Kesukaran	0,37 – 0,89	Medium and Easy
Daya Pembeda	0,23 – 0,63	Enough and Good
Reliabilitas	0,60 – 0,80	Tall

a. Normality and Homogeneity Test Results Data on Student Learning Test Results

Table 3. Results of the sample class normality test with the PBL model

Class	N	L_{hit}	L_{tab}	Information
Experiment	31	0,12	0,16	Normal
Control	29	0,08	0,16	Normal

Source: Final test data

Based on Table 3, the results of the normality test of data on student learning outcomes in the experimental class and control class were obtained. Price $L_{count} < L_{table}$. For the experimental class $n = 31$, it was obtained $L_{count} < L_{table}$, namely $0.12 < 0.16$. For the control class $n = 29$ obtained $L_{count} < L_{table}$, namely $0.080 < 0.16$, thus the data is normally distributed.

Table 4. The results of the homogeneity test for the experimental class and the control class.

Class	$\sum$ student	A	F_{hit}	F_{tab}	Information
Experiment	31	0.05	1.58	1.85	Homogeneous
Control	29				

Table 4 shows the results of the homogeneity test of the experimental class and the control class, the F_{count} value was 1.58 and the F_{tab} was 1.85. This means $F_{count} < F_{table}$ at the test level of 0.05%, then the data has a homogeneous variation

b. Student Learning Outcomes Cognitive Aspect Class Sample

The results of the final test carried out obtained data on cognitive learning outcomes of students in the experimental class and control class, in detail can be seen in (Table 5)

Table 5. Average Post-Test Score of sample class students

Sample	Mean	Complete (%)	
		Complete	No complete
Experiment	82,43	74,20	25,80
Control	73,03	51, 72	48,28

Table 5. shows the average post-test score of the sample class students. In the experimental class, an average score of 82.43 was obtained with 74.20% completeness and 25.80% incomplete. In the control class, the average value was 73.03, 51.03% complete, and 48.28% incomplete. Thus, student learning outcomes in the experimental class are higher than in the control class.

Table 6. Results of the sample class hypothesis test

Class	S	This	T _{tab}	Information
Exsperiment Control	15,70	2,23	2,01	H1 Accepted

Table 6 shows the results of the hypothesis test with the t-test at the 5% level of confidence in the experimental and control classes, the prices obtained for $t_{\text{count}} > t_{\text{table}}$ are $2.23 > 2.01$, meaning that the hypothesis is accepted, there is an influence of the video-assisted Problem-Based Learning model on cognitive science learning outcomes for fifth-grade elementary school students Country 31 Payakumbuh.

Assessment of Student Science Learning Outcomes in Psychomotor Aspects.

Assessment of student learning outcomes in psychomotor aspects on the indicators of asking and answering questions for the two sample classes can be seen in (Table 7).

Table 7. Student learning outcomes in the psychomotor aspect of the sample class

Sample	N	Average (%)	
		Ask	Answer Question
Exsperiment	31	65,32 %	83,06 %
Control	29	59,48 %	75.00 %

Source: Final test data

Based on (Table 7), the results of the assessment of students' science learning outcomes in the psychomotor aspect showed an average in the experimental class asking indicator of 65.32%. and the indicator control class asked for 59.48%. The indicators answered questions in the experimental class 83.06% and 75.00% in the control class. Thus, the student learning outcomes of psychomotor aspects in the experimental class were higher than the control class.

Discussion

The learning model using video assistance shows that the cognitive aspects of student learning outcomes in the experimental class are higher than in the control class. The t-test has a significant effect on students' science learning outcomes. This can be proven by the high average

of the experimental class compared to the control class. It is proven that the video-assisted PBL model can improve students' science cognitive learning outcomes with an average score of 82.43 and that of the controls of 73.03 (Table 5). This is in line with the results of research conducted by Pharisees, et al (2017) who reported learning using the Problem-Based Learning model obtained an average of 71.31 and 57.1 in the control class. Furthermore, Rivaldi, et al (2018) also reported average student learning outcomes using the Visually Assisted Problem-Based Learning model with an average learning outcome in the experimental class of 84.27 and the control class of 72.70. Research conducted by Hasanah, et al (2018) reported that the average learning outcomes of experimental class students using the video-assisted Problem-Based Learning model were 80.95 higher than the control class 66.35 using conventional methods.

Statistically using the t-test at the level of $\alpha = 0.05$ dk = 58, it is obtained $t_{\text{count}} = 2.23 > t_{\text{tab}} = 2.01$ and. Thus, H_0 is rejected and H_1 is accepted, meaning that there is an influence of the Video-assisted Problem-Based Learning model on students' natural science learning outcomes. This was confirmed by the results of research conducted by Rivaldi, et al (2018), in this study using the t-test with a significance level of $\alpha = 0.05$ dk = 78 obtained that which was greater than the t_{table} , namely $6.57 > 2.00$. With the results obtained, H_1 is accepted, that is, there is a significant difference in the competence of science knowledge between groups of students who use the audio-visual assisted Problem-Based Learning model and groups of students who use conventional learning.

Furthermore, several studies conducted by other researchers in several elementary schools in Indonesia related to the application of Problem-Based Learning (PBL), statistically the t-test at the test level of 0.05, the results also affect the results of learning science in elementary schools. The results of this research include: by Annisa (2022) on the results of learning science for Class IV students at SDN Gugus I, Kuripan District; Fitriana (2022) results of learning science for fifth-grade students at Sumur Welut III SDN Surabaya; Amran (2022) a class V UPT SD Negeri 382 Pallawarukka; Swarjana (2021) on Science Learning Outcomes of Class III Cluster VII Elementary School Students in Sukasada District, Buleleng Regency; and Arsyam (2021) on the results of science learning outcomes for fourth-grade students at SD Islam Al Azhar 34 Makassar.

Psychomotor Aspect Learning Outcomes

The Problem-Based Learning model is a model that presents a real problem for students to learn to think critically through problem-solving. The assessment of critical thinking skills is carried out by observing psychomotor learning outcomes during learning (Shoimin, 2016). In observing psychomotor learning outcomes, there are 2 aspects of assessment, namely 1) student enthusiasm in asking questions and 2) student enthusiasm in answering questions. The results of this study are in line with the results of Darmayanti's research (2022), that the Problem-Based Learning model can improve students' cognitive and psychomotor learning outcomes in biology lessons.

a. Asking Indicator

Based on the analysis of data on psychomotor learning outcomes in the questioning aspect, the average experimental class was higher than the control class. The experimental class obtained an average of 65.32% while the control class got 59.48%. During the learning process in the experimental class before receiving treatment only 2-3 people asked questions, after using the Problem-Based Learning model assisted by video students who actively asked questions reached 10-13 people. Whereas in the control class, only 5-6 people actively asked questions. It can be stated that the PBL model can motivate students to ask questions. In line with the research results

put forward by Indrayani (2022), that by using the PBL model makes students active in asking opinions and questions, and learning is no longer teacher-centered.

b. Question Answering Indicator

Analysis of data on psychomotor learning outcomes in the aspect of answering questions, the average experimental class students were also higher than the control class. The experimental class obtained an average of 83.06% while the control class got 75%. Before getting treatment the students who were given questions only tended to be silent, students who actively answered were only 3-4 students. Active students continue to be actively involved during learning and passive students continue to be silent during the learning process. After getting treatment in the experimental class, students were more active in answering questions both from the teacher and from their friends. Students who often ask questions during the learning process are not necessarily active in answering. In the control class, many students were less active because they were dominated by the teacher's role in explaining learning material so students only tended to listen. Based on the explanation above, it can be concluded that the Problem-Based Learning (PBL) learning model can improve student cognitive learning outcomes and psychomotor aspects of learning outcomes. This is in line with Farisi, et al (2017) The PBL learning model is not only able to improve students' critical thinking skills, but the PBL model is also capable of motivating and learning outcomes because the learning process is student-centered, thus providing direct experience to students.

Conclusion

Based on the research results obtained, it can be concluded as follows: there is a significant influence of the video-assisted Problem-Based Learning model on the science learning outcomes of fifth-grade elementary school students No. 31, with an average value of cognitive aspects of learning outcomes in the experimental class of 82.43 or more high compared to control class 73.03. Statistically, the assessment of psychomotor aspects of learning outcomes on the indicator asking the experimental class was 65.32% higher than the control class, 59.48%. For indicators answering the experimental class is 83.06% and the control class is 75%. It can be interpreted that the learning outcomes of psychomotor aspects in the experimental class are higher than the control class.

References

- Amran Muhammad Andi Indrayani, Syahrani Syahrani. (2022). Pengaruh Model Pembelajaran PBL Terhadap Pembelajaran IPA Siswa Kelas V SD. *Global Journal Teaching Professional*, Vol 2 No 1 (2022): Mei (Article In Press)
- Annisa, A., Asrin, A., & Khair, B. N. (2022). Pengaruh Model Pembelajaran Problem Based Learning (PBL) terhadap Hasil Belajar IPA Siswa Kelas IV SDN Gugus I Kecamatan Kuripan Tahun Ajaran 2021/2022. *Jurnal Ilmiah Profesi Pendidikan*, 7(2b), 620–627. <https://doi.org/10.29303/jipp.v7i2b.547>
- Arsyam Rasimah. (2021). Pengaruh Metode *Problem Based Learning* (PBL) Terhadap Hasil Belajar IPA Siswa Kelas IV SD Islam . Al Azhar 34 Makassar Sebanyak 39 Siswa Tahun Ajaran 2020/2021. *PINISI. Journal Of Teacher Professional*, [Home](#) > [Vol 2, No 3 \(2021\)](#) > [arsyam](#). DOI: <https://doi.org/10.26858/tpj.v2i3.26089>
- Darmayanti Ifva; Rahmadhani Fitri, Syamsurizal (2022) Pengaruh Model Problem Based Learning terhadap Hasil Belajar Biologi Aspek Kognitif dan Psikomotor. *BIOMA*, Vol.4, No.2, Desember 2022, pp. 18~25
- Fajri, Z. (2018). Bahan Ajar Tematik Dalam Pelaksanaan Kurikulum 2013. *PEDAGOGIK: Jurnal Pendidikan*, 5(1),100-108.
- Farisi, A., Hamid, A., & Melvina, M. (2017). Pengaruh Model Pembelajaran *Problem Based*

- Learning Terhadap Kemampuan Berpikir Kritis Dalam Meningkatkan Hasil Belajar Siswa Pada Konsep Suhu dan Kalor. Jurnal Ilmiah Mahasiswa Pendidikan Fisika*, 2(3), 283-287.
- Fitriana Ana, Bahauddin Azmy, Via Yustitia. (2022). Pengaruh *Problem Based Learning Terhadap Hasil Belajar IPA Siswa Kelas V Sumur Welut III Surabaya. Jurnal Ilmu Sosial Pendidikan dan Humaniora*. Jurnal: <https://jurnal-stiepari.ac.id/index.php/jispendiora> Halaman UTAMA Jurnal : <https://jurnal-stiepari.ac.id/index.php>
- Indrayani Andi; Muhammad Amran; Syahrani. (2022). Pengaruh Model Pembelajaran PBL Terhadap Pembelajaran IPA Siswa Kelas V SD .
Global Journal Teaching Professiona Volume 1, Nomor 4 November 2022 e-ISSN: 2762-1436 DOI.10.35458
- Hasmiati. Muh. Faisal, Abdul Muhsin. (2022). Penerapan Model Pembelajaran *Problem Based Learning* Dalam Meningkatkan Hasil Belajar Siswa Kelas II SD Impres 5/81 Latonro. *Pinisi Journal PGSD* Volume, 2 Nomor 1 Maret 2022 Hal. 196-203 e-ISSN: 2798-9097 hal. 196-203
- Hasanah, N., Marlina, R., & Yokhebed, Y. (2019). Pengaruh Model Problem Based Learning Berbantuan Video Terhadap Hasil Belajar Siswa SMP N 8 Pontianak. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa*, 8(10).
- Rivaldi, K. H. O., Putra, D. K. N. S., & Putra, I.K. A. (2018). Pengaruh Model Pembelajaran *Problem Based Learning* Berbantuan Audio Visual Terhadap Penguasaan Kompetensi Pengetahuan IPA. *Jurnal Ilmiah Sekolah Dasar*, 2(2), 128-135.
- Shoimin, A. (2016). *Model Pembelajaran Inovatif dalam Kurikulum 2013*. Yogyakarta: Ar-Ruzz Media.
- Swarjana I Gede Toni, Putu Subawa, I Ketut Ngurah Ardiawan. (2021) Pengaruh Model Pembelajaran Problem Based Learning Berbantuan Media Gambar Terhadap Hasil Belajar IPA Siswa Kelas III Widyacarya *Jurnal Pendidikan, Agama Dan Budaya* Volume 5, Nomor 2, September 2021, pp 140-149 p-ISSN: 2580-7544 e-ISSN : 2721-2394 Open Access: <http://jurnal.stahnmpukuturan.ac.id/index.php/widyacarya/index>