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# THE EFFECT OF PROBLEM-BASED LEARNING THROUGH ANIMATED VIDEOS ON STUDENTS' INTEREST IN LEARNING SCIENCE AT SD INPRES 2 BESUSU

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## ABSTRACT

This study aims to determine the effect of the application of the Problem Based Learning model assisted by animated video media on the learning interest of fifth-grade students of SD Inpres 2 Besusu. The low interest in learning is caused by learning that is still dominated by conventional methods and the lack of use of interesting media. Animated video media is considered capable of increasing learning interest because it presents material visually and contextually. This study uses a quantitative approach with an experimental design method of one group pre-test and post-test. The research subjects were 25 students. The data were analyzed using a paired sample t-test and showed a significance value (Sig. 2-tailed) <0.05, so the Problem Based Learning model assisted by animated video media has a significant effect on increasing students' learning interest.
**Keywords**: Problem Based Learning; animated video media; IPAS

## INTRODUCTION

Education is one of the main pillars of national life. Through education, humans strive to develop their potential, both physically and spiritually, to grow into individuals with faith, noble morals, intelligence, and skills appropriate to life's needs. Education is understood not only as a process of imparting knowledge, but also as an effort to shape the character, attitudes, and personalities of students. As stated by Rahman *et al*. (2022) Education is a conscious and planned effort to create a learning atmosphere that is enables students to actively develop their potential optimally.

Abdullah (2022) In his research, he stated that the learning process in education functions as a vehicle for developing students' potential comprehensively, not only in terms of knowledge but also in the formation of attitudes, personality, and life skills. In the broader context of contemporary educational research, efforts to create meaningful and holistic learning experiences have increasingly emphasized student-centered and problem-oriented approaches, especially in elementary science education. International studies report that Problem-Based Learning (PBL) encourages active participation, collaboration, and deeper engagement in learning, while the use of multimedia—particularly animated video—supports attention, motivation, and conceptual

understanding through integrated visual and auditory representations.

Nevertheless, prior research generally examines PBL and animated video as separate instructional components. Many studies focus on cognitive outcomes such as achievement or critical thinking, whereas investigations specifically addressing students' learning interest at the elementary level remain relatively limited. Empirical evidence on the integration of PBL with animated video media in primary science (IPAS) learning, particularly within the context of the Independent Curriculum, is still scarce. This indicates a research gap concerning how a problem-oriented pedagogical model combined with visually dynamic digital media influences elementary students' learning interest.

One implementation of this process is seen in the Natural and Social Sciences (IPAS) subject, which is a new subject. in the Independent Curriculum which is a combination of science and science Social Studies. Science and Natural Sciences (IPAS) has been implemented since elementary school with the aim of equipping students to understand the universe and the phenomena that occur in it and their relationship to human social life (Andreani & Gunansyah, 2022). The science and natural sciences learning process emphasizes contextual learning experiences and encourages active student involvement in observing, questioning, experimenting, and drawing conclusions about phenomena around them. Ideally, science and natural sciences learning takes place in a fun, interactive, and real-life environment, for example through simple experiments, environmental observations, or group discussions. This aligns with research conducted by Rosiyani *et al.* (2024) which emphasizes that science learning carried out in a contextual and varied manner can foster enthusiasm and increase students' interest in learning.

Based on the results of observations in class and interviews with the fifth-grade teachers of SD Inpres 2 Besusu, it is evident that students' interest in science remains low. While this study focuses on a specific local context, its findings hold broader relevance as they address a common pedagogical challenge in Indonesia's elementary education. By aligning with the national policy on digital transformation and active learning frameworks, this research serves as a pilot case that provides empirical evidence for the scalability of the Problem Based Learning model combined with animated media across similar educational settings. Information from the fifth grade science teachers shows that out of 25 fifth grade students, only about 12 students (43%) have a high interest in learning, while 16 students (57%) still show a low interest in learning. This is due to the process Learning is still dominated by a one-way lecture method.

Teachers have not implemented a variety of learning models, while media use is still limited to using textbooks as the primary source without utilizing other, more interesting and interactive media. This situation shows that learning has not optimally stimulated students' cognitive engagement, motivation, and attention, three key constructs closely related to learning interest. Teacher-centered instruction and text-dominated materials tend to make students passive, limiting opportunities to actively construct understanding and reducing emotional involvement in the learning process.

Theoretically, Problem-Based Learning (PBL) and multimedia use address these limitations through complementary mechanisms. PBL promotes active knowledge construction through problem solving, discussion, and real-life contexts, which strengthens cognitive engagement and increases learning relevance, thereby enhancing intrinsic motivation. Meanwhile, animated video as multimedia support helps focus attention and facilitates understanding through integrated visual and auditory representations, making concepts more concrete and enjoyable for elementary students. The interaction of these cognitive, motivational, and attentional processes provides a pathway through which learning becomes more meaningful and engaging, ultimately contributing to the development of students' learning interest. This condition has an impact on low student interest in learning, which is reflected in a lack of enthusiasm when participating in science lessons, a lack of seriousness in listening to teacher explanations, a passive attitude in question and answer activities, and a habit of complaining when given assignments. This situation indicates that the ongoing learning has not been fully able to foster student attention, involvement, and curiosity, so innovative efforts are needed in selecting learning models and media that are more appropriate to student needs.

One way to address the above issues is through the implementation of innovative learning models and interactive learning media. The model deemed appropriate in this context is the PBL learning model. Nurul Adha *et al*. (2024), in her research, she said that the PBL model is seen as effective in increasing students' interest in learning because learning is centered on students and demands active student involvement in solving problems related to everyday life. Through PBL, students not only Students not only receive information from the teacher, but actively construct their own knowledge through discussion, investigation, and problem-solving, making learning more meaningful and engaging. This model emphasizes student involvement in solving real-life problems, encouraging them to think critically and creatively, and to collaborate with their peers (Fadilah *et al*., 2025). In its implementation, students not only receive explanations from educators, but are also required to analyze problems, seek information, discuss them, and find solutions. The advantages of this model are that it can improve problem-solving skills, foster active participation, and encourage student interest in participating in learning (Made *et al*., 2021). This is reinforced by research conducted by Budiarti (2021) shows that PBL has a significant effect on improving problem-solving skills in science learning. Research conducted by Sandi *et al.* (2024) also stated that the PBL learning model is also effective in increasing students' interest in learning because it encourages them to be more focused, enthusiastic, and active during the learning process.

According to Zainal (2022), PBL has the characteristic that the learning process is centered on students so that they are responsible for acquire and build knowledge what they are studying. Learning begins with the presentation of a real problem that is unstructured and involves various disciplines, so that students are encouraged to conduct investigations and solve problems actively through collaboration and communication

in groups (Suryani *et al*., 2025). The teacher acts as a facilitator who directs the learning process, while students are trained to conduct self-assessments and peer assessments as part of an evaluation that emphasizes the development of knowledge and thinking skills. Based on Jean Piaget's theory of cognitive development in Ekayanti, (2021), The thought patterns of children in the concrete operational stage, which ranges from 7 to 12 years old, differ from those of adults. During this period, children begin to understand concepts more rationally, not only in concrete matters but also begin to demonstrate more abstract thinking abilities. Ayu *et al*. (2024) emphasizes that every child has a perspective and cognitive development that is not always the same, so appropriate support is needed in their learning process.

Therefore, educators must be able to help students develop relevant understanding through learning strategies that are in line with current technological developments. This shows that cognitive learning theory has a close relationship with modern learning practices.

In line with this, researchers also offer a solution through the use of animated video media. Animated video media is a learning tool that presents material visually, concretely, and interactively, making it easier for students to understand (Astuti *et al*., 2024). The advantage of animated video media is that its presentation is attractive, simple, and in accordance with the characteristics of elementary school-aged children, so that it can increase motivation and interest in learning (Gani *et al*., 2021).

This is reinforced by research conducted by Mauliana (2022) shows that the use of animated videos can increase students' motivation and interest in learning because it presents material in a concrete, interesting, and easy-to-understand way. Research conducted by Supriyani *et al*. (2021) also emphasized that animated video media is effective in helping educators explain science material and making it easier for students to understand the concepts being taught.

Thus, implementing the PBL model alone is no longer sufficient to accommodate students' learning needs in the digital age. Children need a means of delivering material that is capable of. draw attention while facilitating conceptual understanding. Digital media such as animated videos are an effective option because they can provide more concrete, interactive, and contextual visualizations. With the support of these media, students can more easily connect the material to real-life experiences, increase their motivation to learn, and strengthen their logical and creative thinking skills. Therefore, the combination of the PBL model and animated video media is seen as an appropriate strategy to address students' low interest in learning science.

Based on the description, the researcher is interested in solving the problems at SD Inpres 2 Besusu using the PBL model and animated video media. Therefore, the researcher is interested in conducting research with the aim of determining whether or not there is an effect of the problem-based learning model assisted by animated video media on student learning interest in the subject of science at SD Inpres 2 Besusu.

## METHOD

This research uses a quantitative approach with an experimental method (Dehmi *et al*., 2021). In this design, the research subjects were first given a pre-test

to determine the initial state of students' learning interest. Next, the students were given treatment in the form of the application of the Problem-Based Learning model with the aid of animated video media. The intervention was conducted over a total of four sessions. In the first session, a pre-test was administered to establish a baseline for students' interest. The second session involved the first treatment, focusing on "Food Chains" where the animated video illustrated how energy is transferred between animals. The third session continued with "Food Webs," utilizing video media to explain the complex interconnections within an ecosystem. Both videos were designed to transform abstract biological concepts into engaging visual narratives. Regarding the material development and validation process, the researcher initially engaged in intensive consultations with the supervising professor. The materials were then submitted to expert validators for rigorous assessment. Following this, several revisions were made based on expert feedback until the materials were officially approved for classroom implementation. During the implementation, the role of the classroom teacher was as an observer. The teacher monitored the researcher's delivery of the treatment to ensure pedagogical consistency and to observe the students' behavioral responses to the Problem-Based Learning model. Finally, after the treatment was administered, the students were given a post-test in the fourth session to determine changes in learning interest after the learning process.

The research design used was a one-group pre-test and post-test design. In this design, the research subjects were first given a pre-test to determine the initial state of students' learning interest. Next, the students were given treatment in the form of the application of the Problem-Based Learning model with the aid of animated video media. After the treatment was administered, the students were given another post-test to determine changes in learning interest after the learning process (Usman *et al*., 2022).

**Table 1 One Group Pre-test and Post-test Research Design**

| Pre-test | Treatment | Post-test |
|---|---|---|
| $O^1$ | X | $O^2$ |

This research was conducted at SD Inpres 2 Besusu located at Jl. Kimaja No. 33, West Besusu, East Palu District, Palu City, Central Sulawesi. The research was conducted in the 2025/2026 academic year, namely in November 2025. The population in this study were all fifth grade students of SD Inpres 2 Besusu in the 2025/2026 academic year, totaling 25 students. The selection of all 25 fifth-grade students as the research subjects is based on the Total Sampling technique, which is appropriate for populations under 30 to ensure the highest level of representativeness. Methodologically, this group represents a standard classroom size that allows for controlled experimental intervention. Furthermore, these students were selected because the science topics of 'Food Chains' and 'Food Webs' are specifically aligned with the fifth-grade curriculum requirements, making them the most relevant subjects for testing the effectiveness of the Problem-Based Learning model. The sampling technique used was saturated sampling, so that all members of the population were used as research samples.

The research instruments used were a student learning interest questionnaire and an observation sheet. The

questionnaire was designed to measure students' level of learning interest after participating in the learning process and used an ordinal scale, while the observation sheet was used to record students' behavior during the learning activities. The questionnaire was based on indicators of learning interest, namely feelings of enjoyment towards learning, students' attention during learning, interest in the material, and student involvement in learning activities. In addition, the observation sheet was also designed using a Likert scale to observe students' learning interest during the learning process, with indicators in the form of students' facial expressions during learning, students' level of involvement in discussions, students' focus of attention on the material presented, and students' activeness in answering questions or expressing opinions. The questionnaire was given to students during the pre-test and post-test, while the observation sheet was used to observe students' learning interest during the learning process to obtain data before and after the treatment.

The questionnaire instrument was first tested for validity and reliability. The results of the validity test showed that 17 items statement declared valid, while the reliability test produced a Cronbach's Alpha value of 0.897, which indicates that the instrument is reliable and suitable for use.

**Table 2 Results of the Trial Statement Reliability Test**

| Reliability Statistics | |
|---|---|
| **Cronbach's Alpha** | **N of Items** |
| 0,897 | 20 |

The data collection technique in this study was conducted through the distribution of student learning interest questionnaires. The data obtained were then analyzed using descriptive analysis techniques. Descriptive analysis was used to describe the characteristics of student learning interest data using statistical measures in the form of average, median, mode, and standard deviation.

Before conducting a hypothesis test, the data is first tested for prerequisites, including normality and homogeneity tests. The normality test is conducted to determine whether the data is normally distributed, while the homogeneity test aims to determine whether the variances of several samples taken come from the same population and are uniform. If the data meets the assumptions of normality and homogeneity, a paired samples t-test is used. The hypothesis testing criteria are set at a significance level of 0.05, where the significance value of $p < 0.05$ indicates that the alternative hypothesis is accepted. Thus, it can be concluded that the use of the Problem Based Learning model assisted by animated video media has an effect on the learning interest of fifth-grade students at SD Inpres 2 Besusu.

## RESULTS AND DISCUSSION

This research was conducted at SD Inpres 2 Besusu Palu in the 2025/2026 Academic Year with 25 students in grade V as research subjects. This research aims to determine the effect of using problem-based learning models assisted by animated video media on students' learning interest.

The results of the descriptive statistical analysis showed a difference in the increase in students' learning interest before and after treatment. The average score of students' learning interest increased from 73.88 in the pre-test to 83.71 in the post-test.

**Table 3 Results of Pre-test and Post-test of Students' Learning Interest.**

| Evaluation | Pre-test | Post-test |
|---|---|---|
| Maximum Value | 88 | 100 |
| Minimum Value | 63 | 69 |
| Mean | 73,88 | 83,71 |
| Standar Deviation | 7,220 | 8,340 |

The normality test using the Shapiro–Wilk method shows that the data is normally distributed (sig. < 0.05).

**Table 4 Results of the Normality Test of Pre-test and Post-test Data on Students' Learning Interest.**

| Interest in learning | *Shapiro-Wilk* | | |
|---|---|---|---|
| | ***Statistic*** | ***Df*** | ***Sig.*** |
| Pre-test | 0,944 | 25 | 0,183 |
| Post-test | 0,963 | 25 | 0,475 |

Based on Table 4, it is known that the pretest significance value of 0.183 is greater than 0.05, while the posttest significance value of 0.475 is also greater than 0.05.

**Table 5 Paired Sample T-Test Results**

| | Paired Differences | | | | | t | df | Sig. (2. tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Sid. Deviation | Sid. Error or Mean | 95% Confidence interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| **Pretest-Posttest** | 9,82 | 9,48 | 1.89 | 13,74 | 5,90 | 5,17 | 24 | <0,001 |

The results of the hypothesis test show that the significance value (Sig.) obtained is smaller than 0.05. Thus, the alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected, which means that there is an influence of the use of the problem-based learning model assisted by animated video media on the learning interest of fifth-grade students of SD Inpres 2 Besusu.

The research was conducted by applying the Problem Based Learning model combined with animated video media in science learning. Based on the results of data analysis conducted using the paired sample t-test, the significance value (Sig. 2-tailed) was obtained less than 0.05, so that $H_0$ was rejected and $H_a$ was accepted. This indicates that there is a significant difference between students' learning interests before and after the implementation of the PBL model assisted by animated video media. Thus, it can be concluded that the implementation of the PBL model assisted by animated video media has a significant effect on the learning interests of V grade students of SD Inpres 2 Besusu in the science subject.

The increase in the average student interest score from the pretest to the posttest indicates that the implementation of the learning model and media had a positive impact on student interest in learning. This increase is reflected in indicators of interest in learning, including feelings of enjoyment in participating in learning, attention to the material, active involvement in learning activities, and student discipline during the learning process.

The PBL learning model is a learning model that emphasizes active student involvement in The learning process involves solving problems related to everyday life. Through this model, students not only act as recipients of information but also as active learning subjects who engage in critical thinking, discussion, collaboration, and responsibility for the learning process and outcomes. This shift from passive reception to active engagement is explained by the synergy between Mayer's Multimedia Learning Theory and PBL's Constructivist framework. The animated videos on 'Food Webs' function as a cognitive scaffold that lowers instructional complexity, allowing students to allocate

their mental resources toward high-level critical thinking. Empirically, the video acts as a 'problem trigger' that sparks situational interest. This interest is then channeled through the PBL stages of discussion and collaboration, where students socially construct their understanding of ecosystems. Consequently, the learner is no longer a vessel to be filled but an active investigator responsible for synthesizing complex biological connections. The implementation of the PBL model provides students with the opportunity to be directly involved in learning, making learning more meaningful and fostering student interest in learning. This aligns with the problem-solving theory proposed by John Dewey in Suryani *et al*, (2025), which states that learning will be meaningful if students are actively involved in the process of investigating and solving real problems, so that the learning experiences obtained become relevant and meaningful for students and help increase student involvement in learning.

Observations during the learning process showed an increase in student activity and engagement after the implementation of the PBL model with the aid of animated video media. Students appeared more focused in following the lesson, actively participated in group discussions, and showed a higher interest in the science and science material. These findings indicate that the implementation of PBL with animated video media is effective the PBL model is able to create a more active and student-centered learning atmosphere.

This condition aligns with Jean Piaget's theory of cognitive development, which states that the learning process will be more effective if it is tailored to the student's cognitive developmental stage. Elementary school students are generally in the concrete operational stage, aged 7–12, and still require direct learning experiences and visual aids to understand abstract concepts (Khusnul Khotimah, 2023). Therefore, the use of animated video media is relevant to be applied in science learning in elementary schools because it is able to present material visually and concretely, making it easier for students to understand learning concepts and increase interest in learning.

The use of animated video media is also supported by Richard E. Mayer's Cognitive Theory of Multimedia Learning (CTML), which explains that learning will be more effective when information is presented through a combination of visual and auditory elements. Presenting material visually and auditorily helps students understand information more easily and supports optimal thinking processes (Nurhatmi, 2025). Thus, animated video media is effectively used to help students understand learning concepts.

In line with this, animated video media plays a supporting role in the implementation of the PBL model. Animated videos present learning materials in a visual and engaging manner, thereby focusing students' attention and helping them understand the problems presented (Maziyah & Zumrotun, 2025). The use of this media makes the learning process more enjoyable and is able to reduce student boredom, which ultimately has a positive impact on increasing students' interest in learning.

The results of this study are in line with previous research conducted by Rustinah, Muhammad Basri, dan Muhajir (2021) shows that the application of the PBL model supported by audiovisual

media can increase student learning interest. These findings reinforce the findings of this study that problem-based learning combined with visual media can increase student interest and engagement in learning.

Research conducted by Putri Farisa Fabiela (2024) also shows that the use of the PBL model assisted by animated video media has a positive impact on students' interest in learning, which is indicated by increased attention, enthusiasm, and active involvement of students during the learning process. Firdaussyiyah, Sri, dan Joko (2025), In their research, they showed that the application of the PBL model assisted by audiovisual media was able to increase students' interest in learning, especially in terms of students' attention and activeness in participating in learning.

The similarity of the results of this study with previous research shows that student-centered learning supported by the use of interesting visual media is an effective learning strategy to increase the interest in learning in elementary school students, especially in science subjects.

Practically, the results of this study provide implications for elementary school teachers in implementing the PBL model, supported by animated video media, as an alternative strategy for teaching science. The application of this model and media can create a more active, enjoyable learning environment, and be tailored to the characteristics and needs of elementary school students.

However, this study has several limitations, including the limited number of subjects, the relatively short duration of the study, and the limited scope of the learning materials. Therefore, future research is recommended to examine the application of the PBL model assisted by animated video media to different materials and educational levels with a longer implementation time to obtain more in-depth and comprehensive research results.

## CONCLUSION

Based on the research results, it can be concluded that the application of the Problem Based Learning model assisted by animated video media has a significant effect on increasing the learning interest of fifth grade students at SD Inpres 2 Besusu. This learning model is able to create a more active, interesting, and meaningful learning atmosphere, thereby increasing student involvement in the learning process. This is reflected in the increase in the post-test scores of students' learning interest after the treatment was given. Thus, the Problem Based Learning model assisted by animated video media is effective and worthy of being recommended as an alternative learning strategy to increase the learning interest of elementary school students, especially in science learning.

Practically, several recommendations can be proposed. Teachers are encouraged to integrate PBL supported by animated video media regularly, particularly in topics that require conceptual visualization and contextual problem situations, with a planned frequency within thematic science learning. Schools need to provide basic digital learning facilities such as projectors, speakers, and access to appropriate animated learning resources. In addition, teacher professional development programs should include training on designing problem-based activities and selecting or developing animated instructional videos that align with students' cognitive characteristics.

For policymakers, support in the form of infrastructure provision, digital content development, and continuous pedagogical training is essential to ensure the effective and sustainable implementation of innovative, technology-supported learning models in elementary education.

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