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THE INFLUENCE OF THE PROBLEM BASED LEARNING (PBL) LEARNING MODEL ON THE CRITICAL THINKING SKILLS OF GRADE V

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ABSTRACT

Penelitian ini bertujuan untuk Analisis Pengaruh Model Pembelajaran Problem Based Learning (PBL) Terhadap Kemampuan Berpikir Kritis Ipas Siswa Kelas V Sd Negeri 091450 Bah Tongguran. Penelitian ini dilakukan di kelas V SD Negeri 091450 Bah Tongguran, dengan populasi yang digunakan adalah seluruh siswa kelas V Negeri 091450 Bah Tongguran dengan Sampel siswa kelas V SD Negeri 091450 Bah Tongguran yaitu 25 orang. Hasil penelitian menunjukkan bahwa penggunaan model pembelajaran Problem Based Learning (PBL) memberikan pengaruh positif terhadap kemampuan berpikir kritis siswa dalam mata pelajaran IPAS. Hal ini dibuktikan dari hasil tes sebelum dan sesudah diberikan perlakuan (pretest dan posttest). Sebelum penerapan model pembelajaran Problem Based Learning (PBL), nilai rata-rata pretest siswa adalah 49.7143, dan setelah penerapan model pembelajaran Problem Based Learning (PBL) meningkat menjadi 82,5. Dari hasil ini diperoleh nilai N-gain sebesar 0,63 yang termasuk dalam kategori sedang. Kesimpulannya siswa mengalami peningkatan kemampuan berpikir kritis yang cukup besar.Hal ini dibuktikan dengan uji N-Gain menunjukkan bahwa nilai hasil N-Gain kelas eksperimen diperoleh nilai rata-rata pretest 49.7143 dan nilai rata-rata posttest 82,5, sehingga diperoleh N-gain 0,63 dengan kategori sedang. Berdasarkan data tersebut, maka dapat disimpulkan bahwa terdapat Pengaruh Model Pembelajaran Problem Based Learning (PBL) Terhadap Kemampuan Berpikir Kritis IPAS Siswa Kelas V SD Negeri 091450 Bah Tongguran

Keywords:
Learning Model; Problem Based Learning (PBL);Critical Thinking

ABSTRACT

This study aims to analyze the influence of the Problem Based Learning (PBL) learning model on the critical thinking skills of fifth-grade students of Sd Negeri 091450 Bah Tongguran. This study was conducted in the fifth grade of Sd Negeri 091450 Bah Tongguran, with the population used being all fifth-grade students of Sd Negeri 091450 Bah Tongguran with a sample of 25 fifth-grade students of Sd Negeri 091450 Bah Tongguran. The results of the study indicate that the use of the Problem Based Learning (PBL) learning model has a positive influence on students' critical thinking skills in the subject of science. This is evidenced by the results of the tests before and after being given treatment (pretest and posttest). Before the application of the Problem Based Learning (PBL) learning model, the average pretest score of students was 49.7143, and after the application of the Problem Based Learning (PBL) learning model it increased to 82.5. From these results, the N-gain value was obtained at 0.63 which is included in the moderate category. In conclusion, students experienced a significant increase in critical thinking skills. This is evidenced by the N-Gain test showing that the N-Gain results of the experimental class obtained an

average pretest value of 49.7143 and an average posttest value of 82.5, so that an N-gain of 0.63 was obtained with a moderate category. Based on these data, it can be concluded that there is an Influence of the Problem Based Learning (PBL) Learning Model on the Critical Thinking Skills of Science in Grade V Students of SD Negeri 091450 Bah Tongguran.

1. Introduction

Education is an important aspect of human life. Education will create humans to be better from time to time, with their respective abilities that also develop as long as they are willing to learn .A country is said to be advanced or not, can be seen from the quality of education in a country (Tahir, 2020). The progress of a country is inseparable from education. Without education, the country will experience various problems such as poverty, social inequality, and low competitiveness (Serevina et al., 2018). Education plays a very important role in shaping the character, scientific and mental development of a child, who will later grow into a human being who will interact and do many things in their environment, both individually and as a social being. Quality education can be achieved through a structured learning process in schools, the management of which is regulated in the curriculum (Ningrum et al., 2023). The curriculum is designed and adapted to meet the ever-evolving educational needs. This development is expected to improve the quality of education and shape the next generation of the nation who have high competence, excellence, and are able to compete (Imaroh et al., 2022). To achieve these goals, appropriate decision-making is needed through reform and innovation in the field of education (Aprina et al., 2024).

One of the policies adopted by the Ministry of Education, Culture, Research, and Technology is the establishment of the Independent Curriculum as a reference and curriculum structure that must be implemented by all educational institutions in Indonesia (Syamsidah & Suryani, 2018). The goal of National Education is to enlighten the nation's life and develop the whole Indonesian person, namely a person who believes in and is devoted to God Almighty and possesses noble character, possesses knowledge and skills, is physically and mentally healthy, and is (Nurwahid & Shodikin, 2021).

spirituality, a strong and independent personality, and a sense of social and national responsibility. All educational institutions in Indonesia, especially formal education, strive to achieve the above national education goals (Darwati & Purana, 2021). Achieving these goals requires a long time and requires a more specific analysis of the objectives of each level of education, tailored to the abilities and needs of students (Anggraini et al., 2022). The goal of education that focuses on developing students' critical thinking skills is to strengthen their skills in analyzing, assessing, and making logical decisions based on available data and information (Puriasih & Trisna, 2022). This aims to better prepare students to face the challenges and dynamics of everyday life,

while also being able to contribute to solving social and economic problems (Liu & Pásztor, 2022). The goal of education that focuses on developing critical thinking skills is to equip students with the skills to analyze, assess, and make appropriate decisions based on available data and facts. Thus, it is hoped that they will be able to think logically, objectively, and efficiently in addressing various problems faced in everyday life (Sianturi et al., 2023).

Higher-order thinking skills encompass various aspects, one of which is critical thinking. Critical thinking involves collecting, interpreting, analyzing, and evaluating information with the aim of reaching credible and valid conclusions. Critical thinking is a process aimed at drawing conclusions about one's beliefs and convictions about what one will do, not merely obtaining answers and grades, but more importantly, questioning the answers, facts, or information available (Ritonga et al. 2020). Critical thinking skills require students to first reflect on the causes and effects of the problems they face and then make decisions to draw objective conclusions. If teachers and students recognize this importance, then a high level of critical thinking is guaranteed. Critical thinking is important because it helps us make informed decisions, solve problems effectively, and understand what is happening around us. Through this ability, individuals can evaluate information objectively, view an issue from multiple perspectives, and avoid errors and prejudice in the thinking process (Silaban, R., Panggabean, F. T. M., Hutapea, F. M., Hutahaean, E., & Alexander, 2020).

Critical thinking skills are crucial for students' cognitive development. They can help them adapt to today's rapidly changing world. With the abundance of innovation and new information, students are required to possess strong critical thinking skills. Data from the Programme for International Student Assessment (PISA) from 2000 to 2022 shows that Indonesian students' scientific literacy remains low. The 2018 PISA assessment results showed Indonesia ranked 72nd out of 77 countries. The latest data, based on PISA 2022 data, shows that Indonesian students' average science score remains 67th out of 81 countries with an average score. PISA results reveal that Indonesian students' critical thinking skills in scientific literacy are still relatively low, with most students only reaching a basic level. To address this issue, a learning approach is needed that emphasizes the development of critical thinking skills, such as skills in analyzing, evaluating, and reflecting on reading content (Astutik, 2022). Therefore, it is important to implement interactive and life-relevant learning methods to help improve these skills. Therefore, Indonesia actually still has the opportunity to improve critical thinking skills because it has undeveloped capacity and potential (Eviota & Liangco, 2020).

Based on the results of field observations, there are still many students regarding improving critical thinking skills in the subject of science for grade V students, totaling 20 students, which are still classified as low and do not understand the learning concepts so that learning achievement is not optimal (Paratiwi & Ramadhan, 2023). Based on the results of the final semester exam (UAS) of grade V students of SD Negeri 091450 Bah Tongguran regarding critical thinking skills in science for 25 students, it is still classified as low as can be seen from the table of results of the final semester exam scores for grade V SD Negeri 091450 Bah Tongguran (Pramesti & Rini, 2019).

Based on the data in the table, it is known that the critical thinking skills of fifth-grade students of SD Negeri 091450 Bah Tongguran in the subject of science are still in the low category. This low achievement is caused by the less than optimal role of students during the learning process, one of which is influenced by the lack of variation in the learning models used by teachers. Teachers tend to use monotonous methods that are often applied previously (Muna & Mujianto, 2023). In addition, students show a tendency to be passive during learning, so that most students often reiterate the contents of the text book directly without thinking from their own understanding and not supporting the enjoyable learning process (Ebrahim & Brown, 2022). Therefore, teachers are required to be more active and creative in selecting and implementing appropriate learning models or techniques to improve the quality of learning and student learning outcomes.

One effort that can be made to overcome these problems is by implementing innovative learning models. Learning models used include the Problem Based Learning (PBL) model. According to Goni et al. (A. suarman Situmorang et al., 2022) the Problem Based Learning (PBL) model is a learning model that uses contextual problems as learning materials, by fostering students' curiosity so they feel motivated and able to find information that can be used as a reference for problem solving so that students are accustomed to solving problems. According to Rorimpandey (Ibrahim, 2018) the Problem Based Learning (PBL) model utilizes contextual problems so that it can provide opportunities for students to hone, develop, and improve their problem-solving skills and face problems in everyday life. Meanwhile, according to Mardani et al. (Sariningsih & Purwasih, 2017) the Problem Based Learning (PBL) model is a learning model that starts from students' understanding of a problem, finding alternative solutions to the problem, and then choosing the right solution to use in solving the problem. Previous research on the influence of the Problem Based Learning (PBL) learning model states that the Problem Based Learning (PBL) learning model can improve students' critical thinking skills through real-world problem-based learning (Dahlia, 2022).

Based on the background above, the researcher is interested in researching "The Effect of Problem Based Learning (PBL) Learning Model on the Critical Thinking Skills of Science Students of Grade V of SD Negeri 091450 Bah Tonggurann in the 2025/2026 Academic Year". This study seeks whether or not there is an Effect of Problem Based Learning (PBL) Learning Model on the critical thinking skills of Science Students of Grade V of SD Negeri 091450 Bah Tonggurann in the 2025/2026 Academic Year".

2. METHOD

This research uses a quantitative approach combined with experimental techniques. The reason the researchers chose quantitative research is because quantitative research methods can be measured numerically, allowing for accurate and transparent data collection. According to Sugiyono (Farida et al., 2019) quantitative research can be defined as a research method based on the philosophy of positivism. This type of research uses a one-group pretest-posttest design, meaning it is conducted within a single subject class without a comparison class. In the initial stage, a pretest is

administered before treatment is given. The initial test is administered by the researcher to determine students' initial abilities before treatment (Fauzia, 2018). The next stage is to administer treatment using the Problem-Based Learning (PBL) learning model. The final stage is to administer a final test (post-test) after treatment is given. This study aims to determine whether the Problem-Based Learning (PBL) learning model has a positive impact on students' critical thinking skills (Astindari & Noervadila, 2019). This research will be conducted at State Elementary School 091450 Bah Tongguran, Bah Tongguran District. This research will be conducted in the odd semester of the 2025/2026 academic year (Rerung et al., 2017).

A population is a general area that includes objects/subjects with a certain number and characteristics, determined by the researcher to be studied and concluded. According to Sugiyono (Dian Eka Saputri1, Septiyati Purwandari2, 2023) a population is a generalized area consisting of objects/subjects that have certain qualities and characteristics determined by the researcher to be studied and then drawn conclusions. The population in this study was all 25 fifth-grade students of SD Negeri 091450 Bah Tongguran.

A sample is a portion of the number and characteristics of a population. According to Sugiyono (Sitinjak et al., 2024) a sample is a portion of the number and characteristics of a population. Sampling in this study was conducted using a non-probability sampling technique, namely by taking samples using a saturated sampling technique, a sampling technique when all members of the population are used as samples. In other words, a saturated sample is a census, where all members of the population are used as samples (Panuntun, 2020). The sample used in this study was 25 fifth-grade students of SD Negeri 091450 Bah Tongguran.

3. RESULTS AND DISCUSSION

Result Description

This research was conducted in the fifth grade of SD Negeri 091450 Bah Tongguran. The purpose of this study was to determine the effect of the Problem Based Learning (PBL) learning model on the critical thinking skills of fifth grade students of SD Negeri 091450 Bah Tongguran. This research was conducted in September 2025. This type of research is quantitative research, as explained in the research method section. The sample in this study was all fifth grade students of SD Negeri 091450 Bah Tongguran, with a total of 25 students (Fuadi & Jalaluddin, 2020). The research data were obtained through the implementation of a pretest and posttest, each consisting of 10 fill-in-the-blank questions (Fannisa Rahmadani & Sudianto Manullang, 2024).

The research data collection was obtained using experiments. The instrument used in the form of an essay was first validated by two validators: one lecturer, Mr. Dr. Aprido B. Simamora, M.Pd., and one teacher, Ms. Melkiwani Pandiangan, S.Pd. The validators assessed the instrument through a previously designed validation sheet. After the validators declared that the questions were suitable for testing, the researcher then proceeded to the next stage (A. K. Koten, M. M. Towe, I. P. Muaraya, 2023).

This study began with the provision of a pretest to students in the form of 10 Fill-in-the-blank questions. Next, the researcher provided an action in the form of the implementation of the Problem Based Learning (PBL) learning model to determine the extent of its influence on the critical thinking skills of fifth-grade students of SD Negeri 091450 Bah Tongguran (Hariadi et al., 2021). After all the necessary data were collected, the next step was to analyze the data. In this study, the researcher conducted a test to see the improvement of students' critical thinking skills in science through the results of the pretest and posttest, which were analyzed using the N-Gain test (Simangunsong, 2015).

N-Gain Test

"N-Gain" is an abbreviation of " *Normalized Gain* " or normalized increase, is a tool used in educational research. The N-Gain test is used to measure the effectiveness of a learning and help measure the increase in student learning outcomes in science learning in grade V of SD Negeri 091608 091450 Bah Tongguran. Calculating the normalized N Gain score uses the following formula:

$$\text{N-Gain} = \frac{\text{Skor Postest - Skor Pretest}}{\text{Skor Maksimal - Skor Pretest}} \times 100$$

Based on the calculations, the gain test results data were obtained as in Table 5.1 below:

Table 1. N-Gain Test Result Data

Nama	Prestest	Posttest	Posttest - Pretest	Skor Ideal (100)-Pretest	N-Gain Score	N-Gain Score X100	Kriteria
AF	43	84	41	57	0,719298246	71,92982456	TINGGI
APT	51	76	25	49	0,510204082	51,02040816	SEDANG
AS	46	90	44	54	0,814814815	81,48148148	TINGGI
AT	82	100	18	18	1	100	TINGGI
BS	44	81	37	56	0,660714286	66,07142857	SEDANG
CS	38	87	49	62	0,790322581	79,03225806	TINGGI
CA	50	85	35	50	0,7	70	SEDANG
DP	52	82	30	48	0,625	62,5	SEDANG
FA	76	82	6	24	0,25	25	TINGGI
GS	49	80	31	51	0,607843137	60,78431373	SEDANG
ID	43	77	34	57	0,596491228	59,64912281	SEDANG
LS	27	82	55	73	0,753424658	75,34246575	TINGGI
MP	41	85	44	59	0,745762712	74,57627119	TINGGI
NSS	43	82	39	57	0,684210526	68,42105263	SEDANG
PM	43	87	44	57	0,771929825	77,19298246	TINGGI
RT	48	82	34	52	0,653846154	65,38461538	SEDANG
RAS	57	81	24	43	0,558139535	55,81395349	SEDANG
RSM	47	78	31	53	0,58490566	58,49056604	TINGGI
SS	51	85	34	49	0,693877551	69,3877551	SEDANG
SIS	54	84	30	46	0,652173913	65,2173913	SEDANG
TP	47	77	30	53	0,566037736	56,60377358	SEDANG
WS	52	100	48	48	1	100	TINGGI
YBS	58	82	24	42	0,571428571	57,14285714	SEDANG
YRP	57	79	22	43	0,511627907	51,1627907	SEDANG
YP	49	87	38	51	0,745098039	74,50980392	TINGGI
JUMLAH	1248	2095	847	1252	16,76715116	1676,715116	
Rata-Rata	**49,92**	**83,8**			**0,670686046**	**67,06860464**	SEDANG
Maksimum	**82**	**100**					
Minimum	**27**	**76**					

Based on this data, the results of the experimental class gain calculation showed that the average *pretest* was 50. The average value and *posttest value* were 8.4 . This shows that students' critical thinking skills have improved very well after using the *Problem Based Learning (PBL) learning model* in the Science subject at SD Negeri 091450 Bah Tongguran. This increase is classified as moderate, with a gain value of 8.4 , which means it is in the range of 0.3 ≤ N-gain < 0.7. Thus, it can be concluded that the *Problem Based Learning (PBL) learning model* is very effective in improving students' critical thinking skills (Amri et al., 2025).

Based on these data, the results of the gain calculation in the experimental class show that the average *pretest score* is 50, and the average *posttest score* is 84. From these results, a gain value of 0.6 7 is obtained, which indicates that the experimental class experienced a moderate increase in critical thinking skills, because the gain value is in the range of 0.3 ≤ N-gain < 0.7 (Salvador et al., 2023).

Discussion

This research was conducted in class V of SD Negeri 091450 Bah Tongguran in the academic year of 2025/2026 from 8-10 September 2025. The population used was all class V students of SD Negeri 091450 Bah Tongguran, with a sample of class V students of 25 people. This research was conducted to determine how the influence of the *Problem Based Learning* (*PBL*) learning model on the critical thinking skills of class V of SD Negeri 091450 Bah Tongguran through *pretests* and *posttests* that had been conducted on students in class V of SD Negeri 091450 Bah Tongguran. From the results of the study, there was a positive influence on learning outcomes with the *Problem Based Learning* (*PBL*) learning model on students' critical thinking skills of science. In this study, researchers used the *Problem Based Learning (PBL) learning model* , it is expected that students can learn through direct experience and can provide simple explanations about the events of eating and being eaten, which means the events of eating and being eaten between living things in sequence (Maisa et al., 2024). In the food chain, energy moves from one organism to another through the process of eating and being eaten, starting with producers (e.g., plants), followed by consumers (herbivores, carnivores, omnivores), and ending with decomposers that return nutrients to the ecosystem. Throughout the process, students are faced with challenges that require critical thinking. The researchers also used a *one-group pretest-posttest research design*(Hutagalung et al., 2023) .

The first step taken by the researcher was to validate 10 Isian questions to the validator, namely Mr. Dr. Aprido B. Simamora, M.Pd. and one teacher, namely Mrs. Melkiwani Pandiangan, S.Pd. After the questions were validated, the researcher then conducted research in class V of SD Negeri 091450 Bah Tongguran, the results of the analysis on *the pretest* and *posttest of class V of SD Negeri 091450 Bah Tongguran with a total of 25 students, before being given treatment, a pretest* was given first with an average score of 49.7143 with the highest score of 80 and the lowest score of 20. After being given treatment using the *Problem Based Learning* (*PBL*) learning model, it got an average score of 82.5 with the highest score of 95 and the lowest score of 70 then after getting the students' science learning results, the score was tested using the n-gain test with a score of 0.63 (Ariyani, 2021). This means that the class showed a significant increase in

critical thinking skills after being given treatment compared to before being given treatment, with a moderate increase category because the n-gain value was in the range 0.3≤ N-gain (Handayani & Koeswanti, 2021).

Thus, it can be concluded that there was an increase in student learning outcomes before and after being given treatment after implementing the *Problem Based Learning (PBL) learning model*, which has proven to be very effective in the learning process (Ardianti et al., 2022). Based on the analysis of the research results above, the use of *the Problem Based Learning (PBL) model* has been proven to improve students' critical thinking skills and provide a significant impact (D. Y. Situmorang & Surya, 2025).

By implementing the *Problem-Based Learning (PBL) model* , students become active in the learning process and are motivated to solve problems. This is in line with Rorimpandey's (Harapit, 2018) opinion, which states that *the Problem-Based Learning* (PBL) model utilizes contextual problems, thus providing students with opportunities to hone, develop, and enhance their problem-solving and everyday life skills. This is also the case with *Problem Based Learning* (PBL) model is learning model that uses contextual problems as material learning, by fostering students' curiosity so that they feel motivated and able to find information that can be used as a reference problem solving so that students get used to solving problems (Djonomiarjo, 2020).

This supports the research findings of Asih et al. (Herzon et al., 2018) who stated that the *Problem-Based Learning (PBL) model can improve elementary school students' critical thinking skills. Sianturi et al. (2024) also stated that the Problem-Based Learning (PBL)* model can improve students' critical thinking skills.

4. CONCLUSION

This research was conducted in class V of SD Negeri 091450 Bah Tongguran, with the population used being all class V students of SD Negeri 091450 Bah Tongguran with a sample of class V students of SD Negeri 091450 Bah Tongguran, namely 25 people. The results of the study showed that the use of the Problem Based Learning (PBL) learning model had a positive influence on students' critical thinking skills in the subject of Science. This was evidenced by the results of the tests before and after being given treatment (pretest and posttest). Before the application of the Problem Based Learning (PBL) learning model, the average pretest score of students was 49.7143, and after the application of the Problem Based Learning (PBL) learning model it increased to 82.5. From these results, the N-gain value was obtained at 0.63 which was included in the moderate category. In conclusion, students experienced a significant increase in critical thinking skills.

This is proven by the N-Gain test showing that the N-Gain value of the experimental class obtained an average pretest value of 49.7143 and an average posttest value of 82.5, so that an N-gain of 0.63 was obtained with a moderate category. Based on these data, it can be concluded that there is an Effect of the Problem Based Learning (PBL) Learning Model on the Critical Thinking Ability of Science in Grade V Students of SD Negeri 091450 Bah Tongguran

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