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Problem Based Learning Strategy on Critical Thinking Skills of Grade X Students in Economics Subject at SMAN 5 Pekanbaru

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Abstract: *The purpose of this study is to examine the effectiveness of implementing problem-based learning (PBL) strategies on students' critical thinking skills in the Economics course at SMAN 5 Pekanbaru. This study employed a quantitative approach using a quasi-experimental method. The study sample consisted of Class X5 as the control group and Class X6 as the treatment group. Data collection was conducted through pre-tests and post-tests, which were then analyzed using statistical tests. The results of the study indicate that the implementation of the PBL strategy has a significant effect on improving students' critical thinking skills. This is evident from the better learning outcomes in the experimental group compared to the control group. These results indicate that the PBL strategy is capable of increasing student engagement, particularly in analyzing and solving problems. Thus, it can be concluded that problem-based learning (PBL) effectively contributes to the improvement of students' critical thinking skills.*

Abstrak : *Penelitian bertujuan menguji efektivitas penerapan strategi Problem based learning (PBL) terhadap kemampuan berpikir kritis siswa dalam mata pelajaran Ekonomi di SMAN 5 Pekanbaru. Penelitian ini menggunakan pendekatan kuantitatif dengan metode kuasi-eksperimen. Sampel penelitian terdiri dari kelas X5 sebagai kelompok kontrol dan kelas X6 sebagai kelompok perlakuan.Pengumpulan data dilakukan melalui tes awal dan tes akhir, yang kemudian dianalisis menggunakan uji statistik. Hasil penelitian menunjukkan bahwa penerapan strategi PBL memiliki pengaruh yang signifikan terhadap peningkatan kemampuan berpikir kritis siswa. Hal ini terlihat dari hasil belajar yang lebih baik pada kelompok eksperimen dibandingkan dengan kelompok kontrol. Hasil ini menunjukkan bahwa strategi PBL mampu meningkatkan keterlibatan siswa, terutama dalam menganalisis dan memecahkan masalah. Dengan demikian, dapat disimpulkan bahwa pembelajaran berbasis masalah (PBL) berkontribusi secara efektif terhadap peningkatan kemampuan berpikir kritis siswa*

Keywords: *Problem based learning, critical thinking skills, economics lessons.*

INTRODUCTION

The learning process is the core of educational activities that aim to help students achieve the expected competencies (Febriani *et al.*, 2020) . In practice, learning involves two main parties: the teacher as a facilitator and the student as a learner, with the aim of conveying messages that cover the cognitive, affective, and psychomotor domains (Daniyati *et al.*, 2023) . Therefore, effective learning positions students not only as recipients of information, but also as active participants involved in the process of discovering, analyzing, and applying the knowledge they acquire. (Rahardi *et al.*, 2025) .

In line with the demands of the 21st century, critical thinking skills have become one of the key competencies included in the 4Cs *(Critical Thinking, Creativity, Collaboration, and Communication).* Students must possess these skills to compete amidst the rapid pace of globalization and technological advancement (Nurhayati *et al.,* 2024) . Critical thinking itself is defined as the ability to process and evaluate information objectively to make appropriate and effective decisions (Salsa *et al.,* 2023) .

Furthermore, Syafitri *et al.* (2021) stated that critical thinking skills need to be developed to help students effectively solve problems and draw conclusions from various possibilities. This way, students are not only able to understand the material in depth but also develop logical, systematic, and reflective thinking patterns when facing complex problems. This demonstrates that critical thinking skills play a crucial role, as they help students identify and solve problems more effectively and efficiently, while also supporting informed decision-making.

In economics, critical thinking skills are crucial because they help students understand economic concepts, issues, and phenomena more deeply. Through these skills, students can analyze information, relate theories to real-world conditions, and evaluate various opinions and data obtained. Thus, students are not merely passive recipients of information but are actively engaged in thinking, evaluating, comparing, and making logical and responsible decisions.

To develop critical thinking skills, learning strategies are needed that encourage students to think actively in solving problems. According to Nasution (2020) , a learning strategy is a comprehensive approach to managing learning activities to deliver material systematically so that learning objectives can be achieved effectively and efficiently. One strategy that can be implemented to improve students' critical thinking skills at SMAN 5 Pekanbaru is *Problem-Based Learning* (PBL).

According to Kusasih *et al.,* (2024) , Problem-Based Learning is a learning strategy that emphasizes problem-solving as the primary means of learning. In its application, students are faced with complex situations or problems that require analysis and application of knowledge to find solutions. Furthermore, Darwati & Purana, (2021) stated that *Problem-Based Learning* can improve students' critical thinking skills, build more meaningful understanding, and train students in linking theory to real-world practice. This is in line with research (Ningrum *et al.*, 2025) which shows that the Problem- Based Learning (PBL) strategy is effective in improving students' critical thinking skills and has a significant impact compared to conventional learning.

Furthermore, research by Husna *et al.,* (2025) shows that problem-based learning can improve students' critical thinking skills through active involvement in the process of identifying, analyzing, and solving problems. Research conducted by Yandhari *et al.,* (2021) also found that the *Problem-Based Learning strategy* is more effective in improving problem-solving skills than other learning methods. Furthermore, research by Fernanda & Marzuqi (2025) concluded that the application of *Problem-Based*

Learning (PBL) has a significant effect on students' critical thinking skills and is able to improve learning outcomes compared to conventional learning.

Based on the results of various previous studies, it can be concluded that the *Problem-Based Learning strategy* has a consistent positive impact on improving students' critical thinking skills. Through problem-solving activities, group discussions, and independent reflection, students can develop logical reasoning, analytical skills, and higher-order thinking skills. Therefore, the *Problem-Based Learning* (PBL) strategy is seen as an appropriate alternative to improve students' critical thinking skills, especially in the Economics subject in grade X of SMAN 5 Pekanbaru.

Based on the description, the researcher is interested in conducting research with the title "The Effectiveness of *Problem Based Learning Strategy* on Critical Thinking Skills of Class X Students in Economics Subject at SMAN 5 Pekanbaru".

METHOD

This study uses a quantitative approach with a quasi - *experimental method* that aims to test the effectiveness of the *Problem Based Learning* (PBL) learning strategy on students' critical thinking skills. The research design applied *is a pretest-posttest control group design* involving two groups, namely the experimental class given PBL treatment and the control class using conventional learning. This research was conducted at SMAN 5 Pekanbaru from January to February 2026. The study population included all 504 class X students. The sample determination was carried out through a purposive sampling technique by considering the similarity of characteristics between groups. Based on this technique, class X5 was obtained as the control class and class X6 as the experimental class, with a total of 40 students each.

Data collection techniques were carried out through pretests and posttests aimed at measuring students' critical thinking skills. The research instruments used had undergone validity and reliability tests, thus being declared suitable for use in the study. Furthermore, data analysis was conducted descriptively and inferentially using the SPSS program. The analysis stages included normality tests, homogeneity tests, paired sample t-tests, and independent sample t-tests. The analysis aimed to determine differences in results and the effectiveness of the treatments given between the two research groups.

RESULTS AND DISCUSSION

The research results were obtained by administering a pretest to both classes before the learning process to determine students' initial abilities. Furthermore, after the learning process, a posttest was administered to measure improvements in students' critical thinking skills. In its implementation, the

experimental class used a *Problem-Based Learning* (PBL) learning strategy, while the control class used conventional learning. The data obtained were then analyzed descriptively to provide an overview of the learning outcomes in both classes.

The analysis results show that the number of students in the control class was 40 people. In the pretest stage, the average student score was 58.27 with a minimum score of 40 and a maximum of 78, and a standard deviation of 8.936. After participating in conventional learning, the average posttest score increased to 70.80, with a minimum score of 60 and a maximum of 88, and a standard deviation of 7.829. Meanwhile, in the experimental class which also had 40 students, the average pretest score was 57.43 with a minimum score of 40 and a maximum of 60, and a standard deviation of 9.221. After implementing the *Problem Based Learning* (PBL) strategy, the average posttest score increased to 70.80, with a minimum score of 60 and a maximum of 98, and a standard deviation of 10.212.

Furthermore, to ensure the validity of the data, a prerequisite analysis test was conducted in the form of a normality test using the Shapiro-Wilk method. The test results showed that all data were normally distributed, as indicated by the significance value (Sig.) in each data group being greater than 0.05. In the control class, the pretest Sig. value was 0.708 and the posttest was 0.062. Meanwhile, in the experimental class, the pretest Sig. value was 0.643 and the posttest was 0.155. Thus, all data met the assumption of normality because the significance value was > 0.05.

In addition, a homogeneity test was conducted to determine the similarity of variance between the control and experimental classes. Based on the results of the homogeneity test using Levene's Test on the posttest data, a significance value based on the mean was obtained of 0.053 > 0.05. This indicates that the variance of the posttest data in both classes is homogeneous.

Once all prerequisites are met, the next step is to conduct a hypothesis test to determine the effectiveness of the *Problem-Based Learning* (PBL) strategy on students' critical thinking skills. The results of the hypothesis test are presented below:

Table 1. Paired Sample T Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Standard Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Control Pretest – Control Posttest	-12,525	4.114	.650	-13,841	-11,209	-19,256	39	.000
Pair 2 Experiment Pretest– Experiment Posttest	-24,650	5,798	.917	-26,504	-22,796	-26,888	39	.000

Source: Data Processing Results, 2026

Based on the results of *the Paired Sample T-Test* , in the control class the Sig. (2-tailed) value was obtained at 0.000 < 0.05 with a calculated t value of -19.256, so it can be concluded that there is a significant difference between *the pretest* and *posttest scores* in the control class. This shows that Conventional learning can also improve students' critical thinking skills. In addition, in the control class the average difference value (mean difference) was obtained at -12.525, which indicates an increase in critical thinking skills by 12.525 points from the pretest to the posttest.

Furthermore, in the experimental class, the Sig. (2-tailed) value was obtained at 0.000 < 0.05 with a t-count value of -26.888, so it can be concluded that there is a significant difference between the pretest and posttest scores in the experimental class. In the experimental class, the mean difference value was obtained at -24.650, which indicates an increase in critical thinking skills of 24.650 points from the pretest to the posttest. Thus, it can be concluded that both classes experienced an increase in critical thinking skills, but the increase in the experimental class was greater than the control class, so the *Problem Based Learning* (PBL) Learning Strategy is more effective in improving the critical thinking skills of class X students of SMA Negeri 5 Pekanbaru.

Table 3. Independent Sample T-Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Standard Error Difference	95% Confidence Interval of the Difference Lower	Upper
Results	Equal variances assumed	3,863	.053	-5,542	78	.000	-11,275	2,035	-15,325	-7.225
	Equal variances not assumed			-5,542	73,075	.000	-11,275	2,035	-15,330	-7,220

Source: Data Processing Results, 2026

Based on the results of the Independent Sample T-Test, a significance value (Sig. 2-tailed) of 0.000 < 0.05 was obtained. These results indicate that there is a significant difference between the posttest results in the experimental class using the *Problem Based Learning* (PBL) learning strategy and the control class using conventional learning. Thus, it can be concluded that the *Problem Based Learning* (PBL) learning strategy is proven to be effective in improving students' critical thinking skills in economics subjects in class X of SMA Negeri 5 Pekanbaru compared to conventional learning.

CONCLUSION

the Problem-Based Learning (PBL) strategy provides more optimal results in improving students' critical thinking skills compared to conventional learning. Improvements in critical thinking skills occurred in both classes, but the class implementing the PBL strategy showed more significant progress. Overall, the use of student-oriented and problem-solving-based learning strategies can create a more active, participatory, and meaningful learning process. Thus, the *Problem-Based Learning strategy* has proven effective in supporting the improvement of students' critical thinking skills, particularly in economics.

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