

The Effect Of The Probing-Prompting Learning Model On Students' Critical Thinking Skills State Senior High School 1 Kuala

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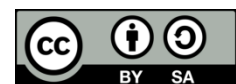
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ABSTRACT

This study aims to determine the effect of the Probing Prompting learning model on students' critical thinking skills in class XI at SMA Negeri 1 Kuala. A quantitative approach with a quasi-experimental design using a nonequivalent control group design was employed. The study involved two classes: the experimental class, which received treatment using the Probing Prompting model, and the control class, which was taught using conventional methods. Research instruments included pre-tests and post-tests that had been tested for validity and reliability. Data analysis involved normality tests, homogeneity tests, and independent t-tests. The results showed a significant difference in post-test scores between the experimental and control classes. The average post-test score of the experimental class (77.21) was higher than that of the control class. Therefore, it can be concluded that the implementation of the Probing Prompting learning model has a significant effect on improving students' critical thinking skills in economics subjects.

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1. Introduction

Education is a continuous and never-ending process, so that it can produce a sustainable quality, aimed at the realization of a human figure for the future, and rooted in the values of national culture and Pancasila (Rodríguez, Velastequí, 2019). Education is an ethical effort from humans and for humans. Education can develop a person's talents to an optimal level within the limits of individual nature, with the aim that everyone can participate honorably in human development and achieve a better life of dignity and dignity (Basnaz, nd).

The development of science and technology has brought about major changes in human life, resulting in the mobility of people, goods, services, and information across spatial

boundaries. These developments have impacted various aspects of society, one of which is the economic aspect (Curriculum Standards and Education Assessment Agency, 2022). Many societal activities have developed and changed over time. Some of these changes and transformations are reflected in the ease of access to information, ease of payment, speed of movement of goods and services, and increasing forms of digital-based collaboration. This has influenced changes in the learning models offered in the field of economics, especially at the upper secondary level.

Education and economic growth cannot be separated from development issues. The concept of development in the socioeconomic field varies greatly depending on its application. Economists have developed development theories based on human capacity to generate energy in the development process, which is then known as investment in human resources (Indrawan, 2019). Education, from an economic perspective, is an investment in an educated and trained workforce. Given that education is a crucial factor in improving the quality of human work, through education, a person's psychomotor and cognitive skills can develop their ideas and ultimately create and increase their productivity (Ujud et al., 2023). In conclusion, education in the economic field plays a role in increasing learning productivity, so that the next generation of the Indonesian nation can better understand and deepen their knowledge of economics.

Economics is a subject that aims to train students to understand the social environment around them (Dewi, 2015). By studying economics, students are also expected to understand economic concepts, recognize various current economic realities and events, and act appropriately.

One of the goals of economics in high school is not only to understand economic concepts, but also to require students to be able to use scientific methods, grounded in a scientific attitude, to solve problems they face. Therefore, the goal of economics in high school is not only to develop facts, concepts, and principles related to economics education in schools, but also to develop students' achievements in their daily lives, becoming productive and efficient individuals.

To ensure the continuity of economics learning, changes to the teaching and learning process are essential. The learning process, which was initially teacher-centered, must now be developed to be student-centered. Therefore, learning objectives need to shift from simply understanding concepts and principles to developing students' ability to apply the concepts and principles they understand. Students' critical thinking skills are an important aspect in learning economics. Critical thinking is an essential skill for students to possess. Critical thinking encompasses mental problem-solving activities that involve analyzing assumptions, providing rationale, evaluating, conducting investigations, and making decisions (M. Putra et al., 2018). Therefore, every student must possess critical thinking skills to be able to solve the economics learning problems they encounter in everyday life.

Critical thinking is one of the most essential skills in 21st-century education. It's a difficult skill to master, requiring significant effort in theory and additional practice to master the techniques. Critical thinking is at the root of many of the skills most needed to navigate

developments and changes in the 21st century. Training this generation to think critically will provide them with the opportunity to adopt this habit as a strong foundation for the future. Critical thinking skills make individuals more sensitive to change, more adaptable, and capable of generating brilliant ideas amidst the increasingly rapid pace of science and technology (Halim, 2022) .

Critical thinking skills are part of basic or intellectual capital, are crucial for every human being, and are a fundamental part of human maturity (Fauziah & Kuntoro, 2022). Critical thinking is a thinking skill used to evaluate or solve problems in learning. Critical thinking skills are very important for students to make the best decisions and solve problems reliably. In this case, critical thinking involves the ability to identify weaknesses and strengths in a particular area of information.

From the statement above, it can be concluded that critical thinking is the ability to solve problems and improve skills in analyzing an idea after understanding a particular problem or fact.

According to a UNESCO report, Indonesia currently ranks 62nd internationally among 190 countries in terms of education quality in 2021 (Pemberian et al., 2024). This survey demonstrates that Indonesian students are still inadequate in thinking and problem-solving. In addition, education in Indonesia still needs to improve students who need high-level thinking skills. Students' high-level thinking can be developed by training critical thinking skills which are measured by giving students questions or giving written tests.

According to Saputra (2015), educational inequality in Aceh Province is relatively low. Educational inequality is a discrepancy between what should be or what is expected and what actually happens. This means that educational development must be evenly distributed without any differences, so that the people or society can enjoy a decent and quality education. The Gini index of education can be used to determine the level of aggregate inequality (inequality) in education. The Gini index ranges between 0 (perfect equality) and 1 (perfect inequality or inequality). Educational inequality measured using the Gini index of education shows how educational inequality occurs in Aceh Province. The results of the study indicate that the calculation of educational inequality using the Gini index of education in Aceh Province is at a low inequality level, namely 0.26 .

Researchers conducted observations at SMA Negeri 1 Kuala and obtained information that the level of critical thinking skills of students at the school was still not optimal. Based on the initial observations conducted by the researchers and assisted by the results of interviews with one of the economics teachers at the school, there were problems experienced by students, especially in the area of skills . This symptom can be assessed from the response of students who only remained silent and did not dare to answer questions posed by the teacher, and students quickly made the decision that everything explained by the teacher was correct without seeking to find out the facts. In this case, teachers at the school still use conventional learning models. One of the learning models included in the conventional learning models used by teachers at the school is the lecture method. In education, the learning model with the lecture method is used to convey material to students through oral

explanations and guidance (Arif, 2019). By using this approach, it can attract students' attention and engage them more actively in learning activities by understanding the process and how a problem can occur through the material presented by the educator. However, the drawback of this learning model is in the learning process, where in this case students listen more so that students are only guided to know something rather than to do something.

In this learning, researchers attempted and tried to involve one of the Probing Prompting learning models. According to (Batee, 2023) Probing Prompting is a learning method that encourages students to think more deeply about a problem by the teacher giving or presenting a series of demanding questions, so that students' knowledge, attitudes, and experiences with new knowledge being learned can be developed and linked according to their abilities, namely through critical thinking. One model that can make students active and critical in learning is the probing prompting learning model. This is because this learning model is developed by asking a series of questions designed to explore students' guidance and exploration ideas (Qudsiyah et al., 2022). It can be concluded that learning using the probing prompting model means developing students' full capacity naturally, thus increasing the activity of the thinking process by connecting knowledge with experiences that students have understood.

This is in accordance with previous research (Ummah, 2019) entitled "The Effect of Implementing the Probing Prompting Learning Model on Students' Critical Thinking Skills in Economics Subjects at SMA Negeri 1 Tambang" where researchers found research results that there was an increase after implementing the probing prompting learning model with an average of 85.60 which is classified as very good.

Learning using the probing prompting method means presenting activity sheets to students efficiently and systematically. Through regular and systematic training, students are able to develop their conceptual understanding individually and use this conceptual understanding as a foundation for conceptual understanding at the next level. Based on the problems that occurred, researchers realized the importance of students' level of critical thinking skills in the learning model. The researcher wants to conduct a study entitled "The Effect of the Probing Prompting Learning Model on the Level of Critical Thinking of Students at SMA Negeri 1 Kuala".

2. Research Methodology

According to Sugiyono (Setiawan, 2021), quantitative research is a research method based on the philosophy of positivism and is considered a scientific method because it meets scientific standards systematically, objectively, structured, rationally, and concretely.

Educational practices with students in the classroom or in a room require strict control and student interaction with the environment due to the formation of natural subjects in a group (naturally formed intact group), such as student groups in a class (Abraham & Supriyati, 2022). Quasi-experiments have the aim of comparing between two classes that have equivalent subjects.

3. Result and Discussion

Homogeneity Test

The data used in the homogeneity test is the same learning outcome data as in the previous normality test. The results of the homogeneity test calculations on the learning outcome data were obtained using SPSS version 25, which are presented in the following table.

Table 1. Homogeneity Test Results

		Levene Statistics	df1	df2	Sig.
Critical Thinking	Based on Mean	.837	1	66	.364
	Based on Median	.596	1	66	.443
	Based on Median and with adjusted df	.596	1	65,413	.443
	Based on trimmed mean	.708	1	66	.403

Source: SPSS Processed Data

Table 1 shows the results of the homogeneity test of variance for critical thinking skills between the experimental and control classes using the Levene test. This test was conducted using several approaches, namely based on the average value (mean), median, median with degrees of freedom adjustment, and trimmed mean. The results show that all significance values (Sig.) are above 0.05, namely 0.364; 0.443; 0.443; and 0.403. Because these values are greater than 0.05, it can be concluded that the data for both groups have the same variance or are homogeneous. This means that the requirement for data homogeneity has been met.

Differences in Students' Critical Thinking Abilities in the Experimental Class

The experimental class was given treatment in the form of the application of the probing-prompting learning model with the aim of improving students' critical thinking skills. Before the treatment was given, students took a pre-test to measure their initial abilities in the material to be learned. After the learning process was completed, students were given a post-test to determine whether there had been an improvement in their critical thinking skills. A comparison between the pre-test and post-test results was used to assess the effectiveness of the probing-prompting model in improving students' critical thinking skills.

Table 2. Pre-test and Post-test Results Data for the Experimental Class

Information	Pre-Test	Post-Test
Minimum	5	40
Maximum	65	100
Average	33.82	77.21

Source: SPSS Processed Data

Based on Table 4.4, it can be seen that there is a significant difference between the pre-test and post-test scores in the experimental class. During the pre-test, the average score obtained by students was 33.82 with a total of 34 participants. After being given treatment through the application of the probing prompting learning model, the average post-test score increased to 77.21 with the same number of students. This indicates that there was an increase in students' critical thinking skills after the application of the probing prompting learning model in the learning process.

Differences in Students' Critical Thinking Abilities in Control (Conventional) Classes

In addition to the experimental class, a pre-test and post-test were also administered to the control class. These tests aimed to determine differences in students' critical thinking skills before and after learning without the probing-prompting model. In the control class, learning was conducted conventionally, using lectures, question-and-answer methods, and taking notes from the textbook. The results of the pre-test and post-test in the control class are presented in the following table for comparison with the results obtained in the experimental class.

Table 3. Pre-Test and Post-Test Results Data for the Control Class

Information	Pre-Test	Post-Test
Minimum	10	30
Maximum	65	100
Average	35.00	61.03

Source: SPSS Processed Data

Based on the results of the two tests, there was a difference in the average scores between the pre-test and post-test. The average pre-test score was 35.00, while the average post-test score increased to 61.03. This data indicates an improvement in learning outcomes after the treatment was administered. However, there were still a number of students who had not achieved optimal mastery.

Descriptive N-Gain of Control Class and Experimental Class

Based on the analysis results, it was found that the average N-Gain in the experimental class was higher than that in the control class. This indicates that the increase in students' critical thinking skills is more significant in classes that use the probing prompting learning model. These findings show that the application of this learning model has a positive impact on improving students' critical thinking skills. On the other hand, the improvement that occurred in the control class that used conventional learning methods tended to be lower. Details of the N-Gain calculation results for each class are presented in the following table.

Table 4. N-Gain Results of Control Class and Experimental Class

Class	Information	N	Mean	Standard Deviation
Experiment	Pre-Test	34	33.82	14,463

	Post-Test	34	77.21	16,292
	N-Gain	34	66.53	22,861
Control	Pre-Test	34	35.00	15,025
	Post-Test	34	61.03	17,700
	N-Gain	34	37.37	33,939

Source: SPSS Processed Data

Table 4.6 shows that the average *N-Gain value* of the experimental class was 66.53 , higher than the control class, which was only 37.37. This increase occurred after learning with the *probing prompting model* in the experimental class, while the control class used the conventional method. These results show that the *probing prompting model* is more effective in improving students' critical thinking skills.

Hypothesis Testing

Hypothesis testing was conducted after it was known that the pre-test and post-test data were normally distributed and had homogeneous variance. Based on the results of the normality and homogeneity tests, it was obtained that the data on students' critical thinking skills met both requirements. Therefore, to determine whether or not there was an effect of the use of the *probing prompting learning model* on improving students' critical thinking skills at SMA Negeri 1 Kuala, the *Paired sample t-test* and the *Independent Sample t-test* were used . This test was conducted using the SPSS version 25 program. The hypotheses to be tested have the following provisions:

- Ha : The use of the probing prompting learning model has an effect on the level of critical thinking of students at SMA Negeri 1 Kuala.
- Ho : The use of the probing prompting learning model does not affect the level of critical thinking of students at SMA Negeri 1 Kuala.

The basis for making the decision is as follows:

- If the Sig value (2-tailed) > 0.05, then Ho is accepted and Ha is rejected.
- If the Sig value (2-tailed) < 0.05, then Ho is rejected and Ha is accepted.

Results of the Paired Samples Test of the Experimental Class on Problem-Solving Ability

Table 5. Results of the Paired Samples Test for the experimental class

Paired Samples Test					
Paired Differences				t	df Sig. (2-tailed)
Mean	Standard Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
			Lower	Upper	

Pair	Pre_								
1	Ex-	-43,382	16,130	2,766	-49,010	-37,754	-15,682	33	.000
	Post_								
	Ex								

Source: SPSS test result data

Based on the results of the Paired Sample t-test, it was found that there was a significant difference between the pre-test and post-test scores in the experimental class. The analysis results showed an average difference of -43.382 with a significance value of 0.000 ($p < 0.05$). A significance value smaller than 0.05 indicates that the difference is statistically significant. Thus, it can be concluded that there was a significant increase in learning outcomes after the application of the treatment, namely the probing prompting learning model. The difference between the pre-test and post-test scores shows that the applied learning model is effective in improving students' critical thinking skills in the experimental class.

Results of the Paired Samples Test of the Control Class on Problem-Solving Ability

Table 6. Results of the Paired Samples Test for the control class

Paired Samples Test											
		Paired Differences				t	df	Sig. (2-tailed)			
		Mean	Standard Deviation	Std. Error	95% Confidence Interval of the Difference						
					n	Mean				Lower	Upper
Pair 2	Pre_Control - Post_Control	-26,029	21,665	3,715	-33,589	-18,470	-7,006	33	.000		

Source: SPSS test result data

The results of the Paired Sample t-test in the control class showed a significant difference between the pre-test and post-test scores. The average difference value of -26.029 with a significance value of 0.05 ($p < 0.05$) indicates that the difference is statistically significant. Thus, it can be concluded that there was an increase in student learning outcomes after the conventional learning treatment was given. This significant difference in pre-test and post-test scores shows that although the increase was not as large as the experimental class, the conventional learning model still had an impact on students' critical thinking skills in the control class.

Results of the Independent Sample T-Test on Problem-Solving Ability in the Experimental Class

The independent sample t-test analysis on the post-test values can be seen in the table below:

Table 7. Results of Hypothesis Testing of Critical Thinking Ability

Test	T	Sig (2-tailed)	A	Information
Independent Samples t-test	-15,682	.000	0.05	Influential

Source: SPSS Processed Data

Table 4.9 shows the results of the independent sample t-test on the post-test scores of students' critical thinking skills. The significance value (Sig. 2-tailed) obtained is 0.000. Based on the decision-making criteria, if the significance value < 0.05 then H_0 is rejected and H_a is accepted. Because $0.000 < 0.05$, it can be concluded that there is a significant difference between the experimental class and the control class. Thus, the use of the probing prompting learning model has a significant effect on improving students' critical thinking skills at SMA Negeri 1 Kuala.

4. Conclusion of Research Result

The Probing Prompting Learning Model in Improving Students' Critical Thinking

This research was conducted at SMA Negeri 1 Kuala involving two classes as research subjects, namely class XI.E as the experimental class and class XI.D as the control class. Class XI.E received special treatment in the form of the application of the probing prompting learning model, while class XI.D underwent conventional learning in the form of the lecture method (Teacher-centered). The research was conducted in two learning meetings for each class.

The implementation of learning in the experimental class began on May 21, 2025, which took place during the first lesson period (08.10–08.50 WIB) and the second lesson period (08.50–09.30 WIB). Learning activities in this class were carried out using the Probing Prompting learning model, which is a learning model that aims to stimulate students' thinking skills by providing initial questions (pompting), which are then followed by follow-up questions (probing) to guide students in the process of reasoning and understanding concepts in more depth. The material taught in this learning process includes the topics of monetary policy and fiscal policy, which are two important components in macroeconomic studies. In the first meeting, learning began with the teacher giving initial questions (pomping) to explore students' prior knowledge. The questions focused on the definition of fiscal policy and the differences between taxes and subsidies. Observations during the learning process revealed that students demonstrated active engagement and confidence in openly expressing their ideas and opinions in class.

Next, the teacher asked follow-up questions (probing) that prompted students to discuss various economic issues in groups, such as the impact of monetary policy, the reasons behind interest rate hikes during times of high inflation, and the relevance of these phenomena to everyday life. This activity sparked a dynamic discussion among students, where they exchanged opinions and collaborated to solve the problems presented by the teacher. After the discussion, the teacher distributed pre-test questions aimed to measure students' initial

abilities before implementing the learning model. Next, the teacher provides stimulus in the form of graphs and articles relevant to the topic of monetary policy. This stimulus is used as a learning resource for students to analyze the relationship between interest rates and inflation rates. Students then work on the Student Worksheet (LKPD) independently, but are still directed to discuss the results of their work with group members. At the end of the learning session, the teacher provides direct feedback on students' answers and opinions, and clarifies any concepts that may not be fully understood. Finally, the teacher directs students to reflect on the learning process and provides information about the material to be covered in the next meeting.

The second meeting took place on May 23, 2025, during the 1st lesson period (07.45 – 08.25 WIB) and the 2nd (08.25 - 09.05 WIB). Continued with fiscal policy material. The learning strategy still follows a probing-prompting pattern, where students are first given questions to stimulate basic understanding, then directed to an in-depth analysis of the impact of fiscal policy on the economy. The teacher provides a stimulus in the form of a case study of the State Budget (APBN) to help students understand how fiscal policy can be used to reduce unemployment or encourage economic growth. Students work on analytical tasks through LKPD and presentations of discussion results, then the teacher provides clarification and feedback on the discussion results. Learning by completing post-test questions to measure student abilities after being given treatment is then concluded with reflection and evaluation to measure the extent to which learning objectives have been achieved.

Meanwhile, learning in the control class was conducted using a conventional lecture-based approach and individual assignments. The teacher served as the information center and primary transmitter of learning materials. The first meeting was held on May 19, 2025, during the fourth period (9:45–10:30 WIB) and fifth period (10:30–11:15 WIB). The first meeting began with an apperception and presentation of the learning objectives, followed by a pre-test to assess students' initial abilities. The teacher then explained the definition and instruments of monetary policy. Students took notes, then read the relevant chapters from the textbook, and individually completed the practice questions in the worksheet. This activity involved minimal interaction between students, and students played a more passive role compared to the experimental class.

The second meeting was held on May 23, 2025, during the 5th and 6th periods (10:30–11:15) and 6th periods (11:15–12:00). In this second meeting, the control class continued with a discussion of fiscal policy. The teacher again used the lecture method to explain the basic concepts, objectives, and types of fiscal policy. Students took notes from their textbooks and followed the teacher's directions in comparing expansionary and contractionary fiscal policies. After that, students are given a simple case study which is discussed in the form of a guided discussion with teacher guidance. The results of the discussion were presented briefly by each group, and continued with working on the post-test questions, then the teacher closed the lesson with a summary of the material and a written evaluation.

Based on the learning implementation, it appears that the probing-prompting model applied in the experimental class is more effective in stimulating student learning activity, developing critical thinking skills, and providing more space for students to explore economic concepts independently and collaboratively. In contrast, the lecture method applied in the control class tends to result in one-way interactions that less actively engage students in the thinking process. Therefore, learning in the experimental class is more effective in creating an active and meaningful learning environment for students.

Based on the results of data processing obtained from the pre-test and post-test questionnaires, it is known that the average value of students' collaboration skills in the experimental class is higher than that in the control class. These results can be seen in detail in Table 4.4 and Table 4.5. Furthermore, based on the results of the hypothesis test of the paired sample t-test above, it can be seen that the sig value (2 tailed) of probing prompting is 0.000, which means that based on decision making $0.000 < 0.05$, then H_a is accepted H_0 is rejected, which means there is a significant influence of the use of the probing pumping learning model in improving critical thinking skills. The results of the independent sample t-test comparing the conventional lecture method model with the probing pumping model obtained a sig value (2 tailed) of 0.000 based on decision making $0.000 < 0.05$, then H_a is accepted H_0 is rejected, which means that probing pumping is effective in improving critical thinking skills.

Based on the analysis of the post-test results, it was found that the most prominent indicator of critical thinking ability was the advance clarification indicator, namely in questions 12, 13, 15, and 16. This shows that students in the experimental class were able to demonstrate better abilities in explaining, clarifying, and sharpening their understanding of the concepts studied, especially in the advanced clarification aspect. This success is strongly suspected to be the result of the application of the probing prompting model which systematically trains students to provide deeper explanations through a series of directed questions from the teacher.

Thus, learning using the probing-prompting model not only improves learning outcomes in general but also specifically develops students' critical thinking skills, particularly in the area of advanced clarification. This finding aligns with 21st-century learning objectives, which emphasize the importance of developing higher-order thinking skills and collaborative skills in the learning process.

This research is supported by several previous studies, such as, according to Ghufroon (2023), active learning models such as probing prompting have been proven to be more effective than lecture methods. This is because the model can increase student participation, responsibility, and independence in learning. Ghufroon emphasized that in active learning, students are directly involved in the process of thinking, analyzing, and solving problems. This active involvement creates a more lively, communicative, and participatory classroom atmosphere. In contrast, in teacher-centered learning, such as the lecture method, students tend to be passive, acting solely as recipients of information without in-depth interaction or the opportunity to explore knowledge independently. This situation hinders the development of

students' critical thinking skills. These findings align with the conditions observed in this study, where students in the experimental class demonstrated an active, enthusiastic, and creative attitude in participating in the learning process, while students in the control class appeared less engaged and more dependent on the teacher as the primary source of information.

Furthermore, according to Wulandari and Rahayu (2021), in an experimental study conducted on eleventh-grade high school students, they found that the application of the Probing Prompting learning model significantly improved students' critical thinking skills, particularly in analyzing and evaluating information. The results showed that students' average posttest score increased from 62.3 to 83.1, indicating that this approach was effective in developing analytical thinking patterns and improving students' understanding of the learning material.

In line with these findings, Saputri and Nasution (2022), through a quasi-experimental study on economics in eleventh grade, concluded that the use of the probing-prompting model significantly contributed to improving students' learning outcomes and critical thinking skills. In their study, students' critical thinking skills in the experimental class increased by 40% compared to students who participated in the lecture method. These results indicate that the probing-prompting model can create a more meaningful learning process and encourage students to think deeply in understanding economic concepts.

Thus, the various research results strengthen the findings in this study that the probing prompting model is effective in improving students' critical thinking skills, because it provides space for students to think independently, be actively involved in discussions, and develop the ability to analyze and evaluate information systematically.

Conclusions

Based on the results of research that has been conducted regarding the influence of the probing prompting learning model on students' critical thinking skills at SMA Negeri 1 Kuala, it can be concluded that: The application of the probing prompting learning model can significantly improve students' critical thinking skills. This is evidenced by an increase in the average score of students in the experimental class from a pre-test of 33.82 to a post-test of 77.21. The significant difference between the experimental class and the control class shows that students taught using the Probing Prompting learning model have better critical thinking skills compared to students who use conventional methods. The probing prompting model has been proven to be able to activate students in the learning process, encourage them to think deeply, and develop analytical, interpretation, and decision-making skills in solving economic problems.

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