



## The Effect of Inquiry-Based Learning on the Critical Thinking Skills of Eleventh-Grade Social Science Students in Economics

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### ABSTRACT

This study was conducted to highlight the importance of enhancing students' critical thinking skills through effective teaching methods. Using a quasi-experimental design with a post-test approach, the research involved 36 eleventh-grade students from MA Salafiyah Syafi'iyah, divided into an experimental group and a control group. The study aimed to examine the impact of the Inquiry-Based Learning (IBL) method on students' critical thinking abilities in economics. Descriptive and statistical analyses were used to evaluate the data. Results showed a clear difference between the two groups: the control class had an average score of 63.89, while the experimental class, which applied the IBL method, achieved an average of 88.29. A paired samples test showed a Sig. (1-tailed) value of 6.664 > 0.005, indicating a statistically significant improvement. These findings demonstrate that the IBL method effectively enhances students' critical thinking skills compared to traditional teaching methods. The implication of this study is that adopting inquiry-based approaches in economics education can foster deeper understanding and better cognitive engagement among students.

## Introduction

Education serves as a transformative process aimed at developing students' inherent potentials, thereby equipping them to navigate the multifaceted challenges of contemporary life. To effectively prepare students for a complex and rapidly evolving world, it is imperative that education fosters a comprehensive range of competencies, including intellectual, emotional, and social skills. Among these, the cultivation of critical thinking skills is paramount, as they are essential for effective problem-solving and informed decision-making (Ghaemi & Mirsaeed, 2017). Emphasizing critical thinking within educational frameworks enables students to actively engage in societal discourse, contributing innovative and effective solutions to pressing issues. The development of these skills has become a central focus in modern pedagogy, recognized for their vital role in students' academic achievements and professional readiness (Maharani et al., 2023).

Education thus functions as a foundational tool, preparing students to enter the workforce equipped with analytical abilities, problem-solving capabilities, and robust critical thinking skills. Effective learning environments not only impart subject-specific knowledge but also promote independent learning and stimulate students' cognitive development (Maharani et al., 2023). In the current era, characterized by rapid technological

advancements, students have unprecedented access to vast amounts of information via the internet. While this accessibility offers numerous educational opportunities, it also presents challenges, as students may become reliant on readily available information without engaging in deep, critical analysis. This trend is particularly concerning in disciplines such as economics, where data analysis and critical evaluation are fundamental to sound decision-making processes (Azmi & Kurniawan, 2025).

Observations conducted in the eleventh-grade Social Science class (XI IPS) at MA Salafiyah Syafi'iyah have identified several issues: students exhibit difficulties in formulating questions, demonstrate limited abilities in analyzing arguments, and face challenges in effectively selecting and evaluating information sources. These difficulties contribute to underdeveloped critical thinking skills. To address these challenges, this study explores the implementation of the Inquiry-Based Learning (IBL) method. IBL actively involves students in the learning process, encouraging exploration, questioning, and critical examination of concepts, thereby enhancing their critical thinking abilities (Azmi & Kurniawan, 2025). Research indicates that integrating IBL into educational practices significantly improves students' critical thinking skills and academic performance (Maharani et al., 2023; Arifin et al., 2025).

Furthermore, incorporating Education for Sustainable Development (ESD) within the IBL framework has been shown to enhance students' awareness of sustainability issues, fostering a holistic understanding of complex global challenges (Setiyaningsih et al., 2024). Studies have demonstrated that IBL not only improves critical thinking but also promotes higher-order thinking skills, such as analysis, synthesis, and evaluation (Kaçar et al., 2021; Arifin et al., 2025). The effectiveness of IBL in enhancing critical thinking has been observed across various disciplines, including science, mathematics, and language education (Ghaemi & Mirsaeed, 2017; Zafra-Gómez et al., 2015). Moreover, IBL encourages students to develop self-regulation skills, enabling them to monitor and adjust their learning strategies effectively (Meng & Jumaat, 2024). These competencies are essential for students to adapt to the demands of the 21st-century workforce and society.

Therefore, based on the aforementioned theories, identified problems, and previous research findings, this study aims to examine the impact of implementing the Inquiry-Based Learning (IBL) method on the critical thinking skills of eleventh-grade Social Science students in economics at MA Salafiyah Syafi'iyah. The research seeks to determine the extent to which the IBL approach can enhance students' abilities to analyze, evaluate, and construct logical arguments, thereby strengthening critical thinking competencies essential for 21st-century learning. By fostering an educational environment that emphasizes inquiry and critical analysis, educators can better prepare students to navigate complex real-world issues and contribute meaningfully to society.

## **Research Methods**

This research was conducted as a planned and systematic activity aimed at solving educational problems and testing hypotheses regarding learning effectiveness. The study adopted a quantitative approach using a quasi-experimental method, which allows for comparisons between groups where full randomization is not feasible. As defined by

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Creswell and Creswell, experimental research aims to investigate the effects of an intervention by comparing outcomes between an experimental group and a control group (Creswell & Creswell, 2018). In this study, the intervention was the implementation of the Inquiry-Based Learning (IBL) model in the experimental group, while the control group received conventional instruction. Both groups were selected using purposive random sampling to ensure that the sample aligned with specific characteristics relevant to the study's objectives. The aim was to assess the extent to which IBL could improve students' critical thinking skills in economics.

Quasi-experimental designs are widely used in educational settings due to their practicality and ability to control for certain variables in real classroom environments (Fraenkel et al., 2017). The design used in this study allowed for an authentic assessment of teaching strategies within naturally existing groups. Inquiry-Based Learning, as implemented in this research, encourages students to engage in questioning, exploration, data analysis, and reflective thinking, all of which are crucial components of critical thinking (Topps & Cullen, 2019). According to Chu et al, IBL is particularly effective in fostering independent learning and improving students' analytical abilities across disciplines (Chu et al., 2017). Data were collected using a standardized critical thinking test, which was administered to both groups after the learning intervention. The results were analyzed using an independent samples t-test to determine whether the differences in student outcomes were statistically significant (Han & Ellis, 2021).

This methodology aligns with international standards for experimental research and supports valid inference about the impact of instructional strategies. Several recent studies affirm the reliability of using t-tests and similar statistical tools for educational research involving intervention and control comparisons (Khatib Sulaiman et al., 2024; Muzanni et al., 2018). Moreover, the use of IBL in educational research has consistently shown positive outcomes in enhancing students' higher-order thinking skills, self-efficacy, and cognitive engagement (Hwang et al., 2015; Presnillo & Aliazas, 2024). By structuring the study through a quasi-experimental framework and using robust data analysis techniques, this research contributes meaningful evidence regarding the value of inquiry-based instruction in secondary education, particularly in the subject of economics.

This study was conducted at MA Salafiyah Syafi'iyah in the 2023/2024 academic year. The population consisted of all eleventh-grade Social Science students, totaling 36 students. Due to the small population size (less than 100), the study employed saturated sampling (also known as census sampling), where the entire population was used as the research sample (Hanif et al., 2022). The sample was divided into two classes :

**Table 1.** Population and Sample

Class	Number of Students
XI A (Experimental Class)	18 students
XI B (Control Class)	18 students
<b>Total</b>	<b>36 students</b>

The variables in this study include an independent variable (X) and a dependent variable (Y), each defined as follows:

**Table 2.** Operational Definition

Variable	Operational Definition	Indicators
X (Inquiry-Based Learning Method)	A student-centered learning method that emphasizes critical and analytical thinking processes by allowing students to explore and discover answers independently.	1. Interpretation 2. Analysis 3. Evaluation 4. Inference 5. Explanation 6. Self-regulation (Facione, 2023)
Y (Critical Thinking Skills)	The ability of students to solve problems logically and systematically, both individually and in groups.	1. Question formulation 2. Argument analysis 3. Asking and answering questions 4. Assessing the credibility of sources 5. Evaluating observational reports (Jariyah & Husamah, 2024)

This study employed a quantitative experimental method using a quasi-experimental design. The design involved two groups : an experimental group and a control group. The data collection techniques used in this study include:

- 1) Test, used pre-test and post-test instruments were used to measure students' critical thinking skills. The research instrument used in this study is a multiple choice test developed to measure students' critical thinking skills in Economics subjects. This test consists of 30 multiple choice questions with five answer options (A-E), which are prepared based on critical thinking indicators according to Facione, including: interpretation, analysis, evaluation, inference, explanation, and self-regulation. The questions compiled refer to basic accounting material in accordance with the XI social studies class curriculum at MA Salafiyah Syafi'iyah.
- 2) Observation, used to monitor and document teaching and learning activities during the implementation of the inquiry-based method.
- 3) Documentation, included attendance lists, photos, and official school data as supporting information. The experimental group received the inquiry-based learning treatment, while the control group did not.

The research design can be illustrated as follows :

**Table 3.** Operational Definition

Group	Pre-Test	Treatment	Post-Test
Experimental	Q <sub>1</sub>	Inquiry-Based Learning	Q <sub>2</sub>
Control	Q <sub>1</sub>	Conventional Learning	Q <sub>2</sub>

In this study, data analysis was conducted using SPSS version 21.0, employing several statistical techniques to ensure the validity and reliability of the findings. The methods used are standard in educational research and are supported by recent academic literature. The methods used are standard methods in educational research and are supported by current academic literature. The following are some of the tests that will be used in this study based on several theories (Aldridge et al., 2017; Altman & Bland, 1983; Arian et al., 2019; Bland & Altman, 1999):

1. **Validity Test :** To ensure the accuracy of the test items, the Pearson Product Moment correlation was utilized. This method assesses the degree to which individual items correlate with the overall test score, indicating the consistency of the instrument. The use of Pearson correlation for validity testing is well-established in psychometric evaluations.
2. **Normality Test :** The Kolmogorov-Smirnov and Shapiro-Wilk tests were applied to assess the distribution of the data. These tests determine whether the data follow a normal distribution, which is a prerequisite for many parametric statistical analyses. The importance of testing for normality in statistical analysis is emphasized in the literature.
3. **Homogeneity Test :** Levene's Test was conducted to verify the equality of variances across groups. This test is crucial for confirming the assumption of homogeneity of variances, which underpins the validity of various statistical tests, including the t-test. Levene's Test is a widely accepted method for this purpose.
4. **Independent Samples t-Test :** To examine the difference in post-test scores between the experimental and control groups, an Independent Samples t-Test was performed. This test assesses whether there is a statistically significant difference between the means of two independent groups. The application of the t-test in comparing group means is a standard practice in educational research.
5. **Hypothesis Testing :** The study tested the hypothesis that the use of the Inquiry-based learning method significantly affects students' critical thinking skills. The null hypothesis ( $H_0$ ) posited no effect, while the alternative hypothesis ( $H_a$ ) suggested a significant effect. The t-test results were used to determine the acceptance or rejection of  $H_a$ . If the calculated t-value exceeded the critical t-value at a 0.05 significance level,  $H_a$  was accepted, indicating a significant effect. These analytical methods are consistent with best practices in educational research and are supported by recent studies in the field.

## Findings

Effective education depends not only on the material taught, but also on the learning methods used. In an effort to improve student learning outcomes, various approaches have been developed, one of which is the Inquiry learning model. This model emphasises the active involvement of students in the learning process, encouraging them to ask questions, explore, and discover concepts themselves. This study aims to examine the effectiveness of the Inquiry learning model in improving student learning outcomes in economic subjects in class XI IPS MA Salafiyah Syafiiyah. By using a t-test to compare the experimental class that used the Inquiry method with the control class that used the conventional method, this study showed a significant difference in students' academic achievement. The findings provide deeper insight into the importance of the innovative approach of Inquiry Based Learning method in the learning process.

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### ***Student Learning Outcomes through Inquiry-Based Learning (IBL)***

Student Learning Outcomes refer to the achievements obtained by students after participating in the learning process. These outcomes reflect the extent to which students understand, master, and apply the material that has been taught. In this study, the implementation of the Inquiry-Based Learning (IBL) model significantly improved students' performance.

**Table 4.** Student Learning Outcomes

No	Control Class Name	Score	No	Experimental Class Name	Score
1	Wahidatun Aulia	75	1	Desi Restiani	75
2	Wisdom	60	2	Siti Aminah	85
3	Asti Aulia Zaelani	60	3	Rida Saputri	90
4	Nur Raoda Rabika	60	4	Rahmat Sait	85
5	Zahrani Sholeha	75	5	Afan Firdaus	90
6	Nurul Fadilah	75	6	Riski Saputra Ferry	90
7	Savriatul Khasanah	50	7	Ditha Retnawati	95
8	Vania Ayu Dianlika	55	8	Abdul Hafiz	95
9	Dewi Zahrotus	50	9	Andi Setiawan	90
10	Anggun Ekina Putri	45	10	Nur Alimi	90
11	Faisal Ainiya Qeis	50	11	Putri Fauziah	95
12	Nurul Hikmah	40	12	Dea Febrianti	90
13	Juliana Fiction	70	13	Immawati	95
14	Julia Nur Janah	65	14	Yulianti	90
15	Nur Fadilah	50	15	Ahmad Jamil	85
16	Suci Maharani	90	16	Rahmat Saprizal	90
17	Abdul Damar	85	17	Nia Ramadani	75
18	Hesti Mikaromal	85	18	Wahyudin Moh	90

Based on Table 4. information was obtained that from the application carried out in the classroom using conventional methods and the inquiry method, it can be seen that the learning outcomes of classes that use the inquiry method are more improved than classes that use conventional methods, it can also automatically improve students' critical thinking in solving a problem according to the indicators of inquiry and critical thinking.

### ***Descriptive Test***

Descriptive Test is a statistical analysis technique used to describe or summarize data in the form of tables, graphs, or statistical measures such as mean, median, mode, standard deviation, and frequency distribution. This test does not aim to test hypotheses, but to provide a preliminary overview of the data collected.

**Table 5.** Descriptive Test

	Kelas	N	Mean	Std. Deviation	Std. Error Mean
<b>Hasil Belajar</b>	Control Class	18	63.89	14.608	3.443
	Experimental Class	18	88.89	6.314	1.488

Based on Table 5, it can be seen that the difference between the average learning outcomes in the control class and the experimental class where the ones who got a score below the average in the control class were 12 students out of 18 students and the average

in the experimental class 2 students out of 18 students. Based on the data, there is an average of 63.89 in the control class and an average of 88.29 in the experimental class, so from the two classes, it is known that in the experimental class there is a significant difference in the average.

### **Data of Normality Test**

The data normality test is a statistical procedure used to determine whether the data used in the study is normally distributed or not. In this study, statistical calculations were used to test normality, namely by the Kolmogorov-Smirnov statistical test (K-S Test). The criteria for normal data based on the Kolmogorov-Smirnov test (K-S Test) are if the  $p$ -value  $> 0.05$ , then the data is normal. Conversely, if the  $p$ -value  $\leq 0.05 \rightarrow$  the data is abnormal.

**Table 6.** Data of Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
	Control Classes	Experimental Classes
Kolmogorov-Smirnov Z	0,681	1,239
Asymp. Sig. (2-tailed)	0,743	0,093
a. Test distribution is Normal.		
b. Calculated from data.		

Based on Table 6, the results of the data normality test using the One-Sample Kolmogorov-Smirnov test show that the Asymp. Sig (2-tailed) value for the control class is 0.743. This value exceeds the significance threshold of 0.05, indicating that the data in the control class is normally distributed. Similarly, the Asymp. Sig (2-tailed) value for the experimental class is 0.093, which also meets the criterion for normality. Since both values are above 0.05, it can be concluded that the data in both classes are normally distributed. Therefore, the residuals fulfill the assumption of normality required to proceed to the next stage of analysis.

### **Homogeneity Test**

The homogeneity test is used to determine whether the variance of two or more data groups is the same (homogeneous). This test is important in parametric statistics because many statistical tests, such as the t-test and ANOVA, assume that the variance between groups should be homogeneous. In this study, it was used to test the similarity of variance between two or more groups. The hypothesis in the Levene test is that if *the p-value*  $> 0.05$  then the variance is homogeneous and if *the p-value*  $\leq 0.05$  then the variance is not homogeneous.

**Table 7.** Homogeneity Test Results

		Levene Statistic	df1	df2	Sig.
Achievement result	Based on Mean	13.750	1	34	0.001
	Based on Median	9.858	1	34	0.003
	Based on Median and with adjusted df	9.858	1	26.228	0.004
	Based on trimmed mean	13.765	1	34	0.001

Based on the results of the homogeneity test, the significance value obtained for the average data of the control class and the experimental class was 0.001. This value is less than the predetermined significance level of 0.05. According to the criteria, if the significance value is less than 0.05, it indicates that the population variances are not equal. Therefore, the data shows that the variances between the control and experimental classes are different. It can be concluded that the population in both classes has heterogeneous or unequal variances.

### ***Paired sample t Test***

The Paired Sample t-Test is used to compare two averages of paired samples, such as before and after a particular treatment. In this context, this test is applied to analyze the differences in student learning outcomes before and after the application of the Inquiry learning method in class XI IPS MA Salafiyah Syafiiyah. Hypothesis criteria If  $t_{\text{counts}} > t_{\text{table}}$ , then there are significant differences between the two groups. If  $t_{\text{counts}} \leq t_{\text{table}}$ , then there is no significant difference between the two groups.

**Table 7.** Paired sample t Test Results

Statistics	Experimental Classes	Control Classes
Mean	88.89	63.89
Variance	39.87	213.40
Observations	18	18
Pooled Variance	126.63	-
Hypothesized Mean Difference	0	-
df (Degrees of Freedom)	34	-
t Stats	6.66	-
P(T<=t) one-tail	5.98E-08	-
t Critical one-tail	1.69	-
P(T<=t) two-tail	1.20E-07	-
t Critical two-tail	2.03	-

Based on the results of the t-Test: Two-Sample Assuming Equal Variances statistical test, several important findings were obtained related to the difference in learning outcomes between the experimental class and the control class in Economics in class XI IPS MA Salafiyah Syafiiyah. The average score of students in the experimental class (which uses the Inquiry learning method) was 88.89. The average score of students in the control class (which uses conventional learning methods) is 63.89. The variance in the experimental class was lower (39.87) than in the control class (213.40), which showed that the learning outcomes in the experimental class were more uniform than in the control class.

The results of the  $t_{\text{Stat}} = 6.664$  ( $6.664 > 0.005$ ) hypothesis test, showed that the difference between the two groups was quite significant. The value of  $P(T \leq t)$  one-tail =  $5.98E-08$ , which is much smaller than the significance level of  $\alpha = 0.05$ .  $t_{\text{Critical one-tail}} = 1.69$  and  $t_{\text{Critical two-tail}} = 2.03$ , which means that the  $t$  value of the  $> t_{\text{Critical Stat}}$ , so the null hypothesis ( $H_0$ ) can be rejected. With the  $t$ -count value (6.66) which is greater than the



t-table (1.69 in the one-way test and 2.03 in the two-way test), and the significance value of the P-value is much smaller than 0.05, it can be concluded that there is a significant difference in learning outcomes between the experimental class and the control class. More specifically, these results show that the Inquiry learning method has a positive and significant impact on improving student learning outcomes compared to conventional methods. Thus, the Inquiry method can be considered as a more effective learning strategy in improving students' understanding and learning outcomes in Economics in class XI IPS MA Salafiyah Syafiiyah.

## Discussion

The results of the t-Test: Two-Sample Assuming Equal Variances show a statistically significant difference in learning outcomes between the experimental and control groups. The experimental group, which applied the Inquiry-Based Learning (IBL) model, achieved an average score of 88.89, while the control group, taught using conventional methods, had an average score of only 63.89. This wide gap strongly indicates the effectiveness of the IBL model in enhancing student performance. The p-value (one-tailed) of 5.98E-08 is far below the 0.05 threshold, providing sufficient evidence to reject the null hypothesis. These outcomes suggest that students benefit more from instructional strategies that promote active engagement and the core components of critical thinking. According to Facione (2015), critical thinking involves purposeful, self-regulatory judgment that includes interpretation, analysis, evaluation, inference, explanation, and reflection. The IBL model aligns closely with this framework by requiring students to investigate problems, question assumptions, and draw evidence-based conclusions—thereby fostering precisely the skills Facione identifies as essential.

Kaçar et al. (2022) conducted a meta-analysis that supports these findings, confirming that IBL significantly improves academic achievement across multiple educational levels and disciplines. Their research highlights how IBL fosters student participation and deeper understanding by encouraging learners to construct their own knowledge through guided inquiry. This constructivist process inherently stimulates analysis and evaluation, which Facione (2015) describes as central components of critical thinking. In contrast to conventional methods where students passively receive information, IBL engages them in active meaning-making, enhancing long-term retention and cognitive flexibility. Similarly, Zafra-Gómez et al. (2015) found that the implementation of IBL in higher education not only improved academic performance but also increased student motivation and satisfaction. These psychological factors—especially motivation and confidence—are closely tied to a learner's ability to persist in complex analytical tasks. According to Facione, the disposition to think critically is as important as the skill set itself, and environments that foster curiosity and self-efficacy are crucial in nurturing this disposition. Thus, IBL supports both the cognitive and affective domains required for robust critical thinking.

A systematic review and meta-analysis by Arifin et al. (2025) further confirmed the significant impact of IBL on students' critical thinking skills, particularly in science education. The study concluded that IBL helps learners develop analytical reasoning and

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logical problem-solving abilities, both of which correspond to Facione's (2015) critical thinking taxonomy. Although the research focused on science education, these competencies are equally essential in subjects like economics, where students must evaluate evidence, interpret data, and make sound judgments. Meng and Jumaat (2024) explored the application of IBL in online learning environments and found similar gains in student engagement and performance. This suggests that the benefits of IBL—especially those aligned with critical thinking—are not bound by instructional modality. Whether applied in traditional classrooms or digital platforms, IBL cultivates key thinking habits such as inquiry, reflection, and evaluation, further reinforcing Facione's vision of critical thinking as a transferable and lifelong competency. Furthermore, Darmuki et al. (2023) demonstrated the effectiveness of an Inquiry Collaboration Project-Based Learning model in language instruction. Their results showed increased student participation, comprehension, and confidence, outcomes that mirror the social and metacognitive dimensions of critical thinking emphasized by Facione. This integrated approach exemplifies how IBL supports not only individual reasoning but also collaborative problem-solving—another hallmark of modern critical thinking.

Compared to previous studies, the present research differs in several important ways. First, while much of the existing literature focuses on IBL in science education or higher education contexts, this study specifically examines its impact on critical thinking skills among eleventh-grade students in an economics course within an Indonesian Islamic school. This unique educational and cultural context provides new insights into how IBL functions in secondary-level social science subjects. Second, the study employs a quasi-experimental design using quantitative methods, offering statistical evidence of IBL's effectiveness through rigorous analysis. Many earlier studies used qualitative or mixed methods, which, although valuable, did not provide the same level of empirical certainty. Third, the integration of Facione's theoretical framework into the interpretation of results offers a more focused lens on how IBL contributes specifically to critical thinking development, a dimension that was often mentioned but not explicitly analyzed in prior research.

In conclusion, the implementation of the Inquiry-Based Learning model has been proven to significantly enhance student learning outcomes compared to traditional methods. Anchored in Facione's (2015) theoretical framework, this study affirms that IBL develops the essential cognitive skills and dispositions that constitute critical thinking. The consistency of these findings with international research further solidifies IBL's position as a powerful pedagogical strategy. Beyond improving academic achievement, IBL promotes problem-solving, collaboration, and self-directed learning—skills that are indispensable in today's complex world. Future research should investigate how contextual variables such as teacher training, curriculum design, and school infrastructure mediate the effectiveness of IBL, ensuring its optimal application across diverse learning environments.

## Conclusion

The results of the study show that *the Inquiri* learning method significantly improves students' thinking ability in Economics class XI IPS MA Salafiyah Syafiiyah. This is proven through the paired sample t-test which produces a Sig. (1-tailed) value much greater than

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the required level of significance. The *Inquiri* approach actively engages students in the learning process, encouraging them to think critically, formulate hypotheses, and seek data-driven solutions. This approach differs from traditional methods that are more passive, thus providing a more immersive learning experience. Thus, it can be concluded that the *Inquiri* learning method is an innovative approach that is effective to improve students' thinking skills and is worthy of being applied in various learning contexts at MA Salafiyah Syafiiyah.

The author suggests that teachers at MA Salafiyah Syafiiyah, particularly those teaching subjects beyond Economics, are encouraged to implement the Inquiry-Based Learning (IBL) method in their classrooms. This teaching approach has been shown to significantly improve students' conceptual understanding by engaging them in the process of questioning, investigating, and discovering knowledge on their own. By encouraging students to become active participants in the learning process, IBL not only deepens comprehension but also enhances critical thinking and problem-solving abilities. When applied across various disciplines, IBL fosters a more holistic development of student competencies, including collaboration and independent learning skills. Therefore, its broader adoption in different subject areas could lead to improved academic outcomes and a more dynamic learning environment.

At the same time, it is recommended that schools play an active role in supporting the implementation of the IBL model by providing adequate learning media and relevant resources. These could include project-based learning modules, visual teaching aids, scientific tools, or access to digital technology and internet resources. The availability of these tools allows students to engage more deeply with learning materials by conducting investigations, collecting data, and formulating solutions based on real-world problems. A well-resourced environment also helps teachers to facilitate student-centered learning more effectively, making the inquiry process more meaningful and engaging. As a result, the overall learning experience becomes more interactive, innovative, and aligned with 21st-century educational goals.

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