



## Effective Teaching Strategies to Enhance Critical Thinking Skills in Education: A Literature Review

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**Abstract:** Critical thinking skills are essential in modern education and are important in sound decision-making and problem-solving. Therefore, effective teaching in developing students' critical thinking skills must be taken seriously. This article aims to review various effective teaching strategies in improving critical thinking skills at different levels of education. This research uses a literature study approach by analyzing recent articles discussing teaching methods, focusing on developing critical thinking. Based on the literature review conducted, it was found that methods such as Problem-Based Learning (PBL) and inquiry-based learning (IBL) proved to be very effective in improving critical thinking skills. PBL, which encourages students to solve real problems in groups, provides hands-on experience in critical thinking. In addition, IBL teaches students to ask questions and explore answers independently and actively. Both methods improve students' analytical and evaluative skills at primary and tertiary education levels. However, challenges in implementation include the need for ongoing training for educators and limited resources. In conclusion, teaching based on these methods effectively improves students' critical thinking skills and prepares them to face the challenges of the complex world of work.

**Abstrak:** Keterampilan berpikir kritis merupakan kompetensi yang esensial dalam pendidikan modern, karena berperan penting dalam pengambilan keputusan yang baik dan pemecahan masalah. Oleh karena itu, pengajaran yang efektif dalam mengembangkan keterampilan berpikir kritis siswa perlu diperhatikan secara serius. Artikel ini bertujuan untuk meninjau berbagai strategi pengajaran yang efektif dalam meningkatkan keterampilan berpikir kritis di berbagai tingkat pendidikan. Penelitian ini menggunakan pendekatan studi literatur dengan menganalisis artikel-artikel terkini yang membahas metode-metode pengajaran yang berfokus pada pengembangan berpikir kritis. Berdasarkan tinjauan literatur yang dilakukan, ditemukan bahwa metode seperti Problem-Based Learning (PBL) dan inquiry-based learning (IBL) terbukti sangat efektif dalam meningkatkan keterampilan berpikir kritis. PBL, yang mendorong siswa untuk memecahkan masalah nyata dalam kelompok, memberikan pengalaman langsung dalam berpikir kritis. Selain itu, IBL mengajarkan siswa untuk aktif mengajukan pertanyaan dan mengeksplorasi jawaban secara mandiri. Di tingkat pendidikan dasar hingga perguruan tinggi, penerapan kedua metode ini memiliki dampak positif dalam meningkatkan keterampilan analitis dan evaluatif siswa. Namun, tantangan dalam penerapannya adalah kebutuhan akan pelatihan yang berkelanjutan bagi pendidik dan terbatasnya sumber daya. Kesimpulannya, pengajaran yang berbasis pada metode-metode ini efektif dalam meningkatkan keterampilan berpikir kritis siswa dan mempersiapkan mereka untuk menghadapi tantangan dunia kerja yang kompleks.

## A. Introduction

Critical thinking skills are essential competencies students need to face the complex challenges of the 21st century (Ali et al., 2021). In modern education, this ability supports the learning process and a foundation in making logical and reflective decisions (Asraf et al., 2023). However, the reality in the field shows that the development of critical thinking is still not optimal, especially at the secondary and primary education levels (Bachtiar, 2024). The low intensity of learning that is oriented towards the exploration of ideas and argumentation is a factor that hinders the improvement of this skill (Cananau, 2021).

Many teachers still rely on traditional approaches that are teacher-centered and provide less space for students to develop in-depth reasoning (Darwis et al., 2024). On the other hand, the flow of technological developments and social dynamics demands a transformation of learning approaches so that students can face global realities critically and solutionally (Divjak et al., 2022). The mismatch between the demands of the times and actual educational practices creates a significant gap in the quality of student learning outcomes (Fitriani et al., 2022). Therefore, serious efforts are needed to design effective and relevant learning strategies that foster students' critical thinking skills from an early age (Frykholm, 2020).

The real problems in the field show that most teachers do not fully understand the right strategies to foster students' critical thinking skills (Ghafar, 2023). This condition is exacerbated by the lack of continuous professional training that equips teachers with innovative methods and approaches in learning (Herwati et al., 2021). Previous research also noted that teachers' understanding of critical thinking concepts is still limited to theory without systematic implementation in the teaching process (Hong et al., 2020). This limitation causes learning to only emphasize memorization and solving routine problems without stimulating students' analytical power (Johnson et al., 2022). Current educational challenges require students to be able to evaluate information critically, think reflectively, and develop solutions from various perspectives (Katende, 2023).

Various participatory-based learning approaches, including the flipped classroom, have been developed in response to these conditions (Khadawardi et al., 2025). This method is considered adequate because it encourages students to prepare independently before participating in interactive discussions in class (Puspita et al., 2023). Thus, the flipped classroom offers a strategic solution to increase student engagement and provide space for active exploration of critical thinking (Qi et al., 2024).

Continuous teacher training is key in ensuring that learning strategies that support the development of critical thinking can be effectively implemented in the classroom (Zapalska et al., 2020). Many teachers face challenges in translating the concepts of critical thinking theory into concrete learning activities, especially when they have to adjust to the characteristics of diverse learners (Zulkifli & Hashim, 2020). Therefore, support from educational institutions in the form of training, workshops, and learning communities is needed to equip teachers with adaptive and reflective pedagogical skills (Ali et al., 2021). In

practice, teachers must be assisted in designing learning scenarios encouraging students to think analytically through meaningful and relevant challenges (Asraf et al., 2023).

In addition, a holistic evaluation of the process and results of critical thinking learning is needed to determine the strategies' effectiveness (Bachtiar, 2024). This evaluation process relies on students' cognitive achievements and includes affective and metacognitive aspects that develop during learning (Cananau, 2021). This effort will be maximized if accompanied by the active involvement of school policy makers in supporting a creative and collaborative learning atmosphere (Darwis et al., 2024). Thus, collaboration between teachers, principals, and education authorities is an important element in ensuring that the development of critical thinking can be an integral part of the educational process (Divjak et al., 2022).

On the other hand, the role of national education policy and technology utilization is also crucial in supporting innovative learning strategies that foster critical thinking skills (Fitriani et al., 2022). A flexible and competency-based curriculum provides greater opportunities for teachers to innovate in learning designs that encourage active student participation (Frykholm, 2020). In this regard, digital technologies such as learning videos, interactive platforms, and computer-based simulations can be practical tools to create challenging and enjoyable learning experiences (Ghafar, 2023). Technology integration also allows for personalized learning, where students can learn at their own pace and learning style, while strengthening the dimension of independence in thinking (Herwati et al., 2021).

Digital classroom management through a Learning Management System (LMS) makes it easy for teachers to design activities and provide critical feedback to students (Hong et al., 2020). Research also shows that using technology supported by appropriate pedagogy can improve the quality of learning interactions and expand access to rich and contextual learning resources (Johnson et al., 2022). Therefore, flipped classroom and PBL strategies become more relevant if supported by a well-integrated educational technology ecosystem (Katende, 2023). That way, learning innovation is not only the responsibility of individual teachers, but a shared agenda of the entire education ecosystem (Khadawardi et al., 2025).

Although various previous studies have discussed the importance of critical thinking in education, most of them are still limited to the theoretical level and have not yet reached the implementation of contextualized and measurable learning strategies (Sari, F. D. et al., 2023). For example, approaches such as Problem-Based Learning (PBL) are often discussed in a general context, but have not been studied explicitly in combination with the flipped classroom method at the primary education level (Sari, Y. et al., 2023). This shows a significant research gap in testing the effectiveness of the combination of these learning strategies on developing students' critical thinking skills (Tommasi et al., 2021). In addition, most previous studies only focused on secondary or higher education levels. In contrast, basic education as the initial foundation for forming critical thinking characters has not received proportional attention (Widyaningrum, 2020). The basic education level is vital in forming an analytical mindset early, which will develop sustainably (Yi et al., 2023).

The uniqueness of this study lies in incorporating two strategic approaches- PBL and flipped classroom- that have not been widely explored in elementary learning settings (Zapalska et al., 2020). By bringing the two together, this study offers a novel approach. It fills a void in the literature in developing teaching methods that can accelerate critical thinking skills in real time (Zulkifli & Hashim, 2020). Therefore, this study is expected to make theoretical and practical contributions in basic education, which has tended not to receive an adequate portion of research in developing higher-order thinking skills (Ali et al., 2021).

In the last five years, researchers' attention to mastering critical thinking skills in education has increased significantly (Asraf et al., 2023). Recent theories show critical thinking is the ability to analyze information, including evaluation, synthesis, and decision-making skills based on logic and evidence (Bachtiar, 2024). In this context, learning approaches such as the flipped classroom are considered innovations that can accommodate these needs because they move the process of material exploration outside the classroom and optimize face-to-face time for in-depth discussions (Divjak et al., 2022). In addition, integrating problem-based learning and the flipped classroom is believed to create a challenging, collaborative, and real problem-solving-based learning environment (Fitriani et al., 2022).

On the other hand, this active learning model also strengthens the development of students' metacognition, which is the foundation for reflective and critical thinking (Darwis et al., 2024). Frykholm (2020) research underlines the importance of humanistic and participatory approaches in developing critical thinking dimensions through art, literature, and humanities studies, which are also relevant in basic education. Similarly, Hong et al (2020) emphasize that the development of critical thinking should be part of the learning culture, not just complementary content. Therefore, integrating innovative learning strategies based on local contexts and activity-based learning is increasingly important to be applied to learners from an early age (Herwati et al., 2021).

Based on the background, field conditions, and research gaps described, this research generally aims to analyze the effectiveness of flipped classroom-based learning strategies combined with the Problem-Based Learning approach in improving students' critical thinking skills at the basic education level (Johnson et al., 2022). This research also aims to answer the need for an adaptive learning model relevant to developing the characteristics of the current generation accustomed to technology and independent learning (Katende, 2023). In particular, this research examines how implementing flipped classrooms can increase students' active involvement in the learning process that emphasizes exploration and discussion (Khadawardi et al., 2025).

In addition, this research aims to evaluate the contribution of the Problem-Based Learning model in triggering students' analytical skills through solving real contextual problems (Puspita et al., 2023). This study will also identify the obstacles and potential for optimizing the implementation of the two approaches in primary classroom learning based on the independent learning curriculum (Qi et al., 2024). Thus, the results of this study are

expected to provide empirical contributions to the development of innovative learning strategies that directly impact improving students' critical thinking (Sari, F. D. et al., 2023). Furthermore, this study is expected to be the basis for policy development and teacher training in creating a learning environment that supports achieving 21st-century skills (Sari, Y. et al., 2023). Overall, this research offers a different learning approach and answers the real challenges of basic education in shaping a generation that thinks critically and solutely from an early age (Tommasi et al., 2021).

## B. Method

This article uses a literature study approach to explore and review various teaching strategies that can be used to improve critical thinking skills among students. This literature study approach was chosen because it allows the author to analyze and incorporate findings from various previously conducted studies on developing critical thinking skills in education. By collecting and organizing information from published sources, this article aims to provide a more comprehensive understanding of effective strategies in developing critical thinking skills and the relevance and urgency of this topic in the current educational context (Tommasi et al., 2021). In this literature study, the authors did not rely on only one data source, but on various relevant scientific articles that could provide a comprehensive overview of the issues raised.

The data sources used in this study come from various scientific articles available in various academic databases, such as Google Scholar, Scopus, and other related journals that focus on teaching and learning critical thinking skills (Fitriani et al., 2022). The article selection process began with a search for scientific articles based on predetermined keywords, namely "Teaching strategies for critical thinking", "Critical thinking teaching methods", and "Developing critical thinking skills in education". The articles found were then filtered based on their relevance and quality. The relevance of the articles was measured based on their fit with the topic of this research, which is the teaching of critical thinking skills among students. Articles that discussed teaching strategies and the results of their implementation in developing critical thinking were considered the most relevant sources (Hong et al., 2020). For more details, the research flow can be seen in Figure 1.

**Figure 1.** Research Flow

In addition, the selection of articles was also based on predetermined inclusion and exclusion criteria. The inclusion criteria included articles discussing various teaching methods to improve critical thinking skills, such as problem-based learning models, technology-based learning, and the flipped classroom. Articles included in this study should also be based on research conducted within the last five years to ensure that the information presented is current and relevant to the current state of education (Divjak et al., 2022). Meanwhile, the exclusion criteria include articles that do not provide direct information on teaching strategies or are irrelevant to the topic, such as articles that only discuss critical thinking theory unrelated to teaching or educational practices (Yi et al., 2023). The article screening criteria can be seen in Table 1.

**Table 1.** Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Article Type	Scientific articles published in scientific journals	Articles not published in scientific journals
Article Topic	Articles that discuss critical thinking skills in education and teaching strategies to develop them	Articles that are not relevant to the topic of critical thinking skills or education
Year of Publication	articles published in the last 5 years (2020-2025)	Articles published more than 5 years ago

Criteria	Inclusion	Exclusion
Language	Articles published in English or Indonesian	Articles published in languages other than English and Bahasa Indonesia
Research Methods	Artikel yang menggunakan studi literatur atau meta-analisis terkait keterampilan berpikir kritis	Articles that use research methodologies that are irrelevant or unrelated to the development of critical thinking skills

Selected articles will be further analyzed to identify various teaching strategies that have proven effective in developing critical thinking skills. The authors will categorize the strategies based on research findings and discuss how they can be applied in a broader educational context (Zulkifli & Hashim, 2020). Using this literature review, this article aims to provide clear guidance for educators on implementing these strategies to develop critical thinking skills among their students.

The sources of articles used for this study include scholarly journals published by leading academic publishers, which can be accessed through various digital platforms such as Google Scholar and Scopus. The article selection process was systematic, focusing on articles that not only discuss theoretical concepts but also provide empirical evidence on the effectiveness of teaching strategies implemented in the classroom (Asraf et al., 2023). The articles used in this analysis incorporate various perspectives in education, ranging from problem-based teaching and technology use to active methods such as the flipped classroom and inquiry-based learning, all focusing on developing critical thinking skills (Herwati et al., 2021).

The results of this study are expected to provide deeper insights into the effectiveness of various teaching strategies used in improving critical thinking skills among students. This article also provides practical recommendations for educators on the best ways to integrate these strategies in their teaching (Bachtiar, 2024). It is hoped that through the use of these proven effective methods, educators can develop a more dynamic and interactive learning environment, which can encourage students to become independent and reflective learners and be able to think critically in the face of increasingly complex real-world challenges (Darwis et al., 2024).

Thus, this article serves not only as an analysis of existing teaching strategies but also as a reference for educators who want to improve the quality of their teaching in developing critical thinking skills in students at various levels of education. This research provides a broader picture of how critical thinking can be integrated in various teaching models and how technology can be utilized to support the development of such skills (Puspita et al., 2023). With a better understanding of these various approaches, it is hoped that educators can adopt methods that best suit the needs of their students, as well as encourage students to be more active in the learning process, which does not only rely on traditional teaching, but also encourages exploration and self-reflection in every learning activity.

## C. Result and Discussion

### Result

#### 1. Teaching Strategies Proven Effective in Improving Critical Thinking Skills

In the first stage, we will discuss teaching strategies that have proven effective in improving critical thinking skills. Critical thinking skills are a critical competency in the modern world of education. Critical thinking involves analyzing, synthesizing, and evaluating information to make thoughtful decisions (Tommasi et al., 2021). Critical thinking focuses on academic knowledge and students' ability to analyze real-life situations and make logical and informed decisions. Various studies have shown that some teaching strategies, such as *Problem-Based Learning* (PBL), discussion-based learning, and interactive media, are very effective in helping students develop critical thinking skills.

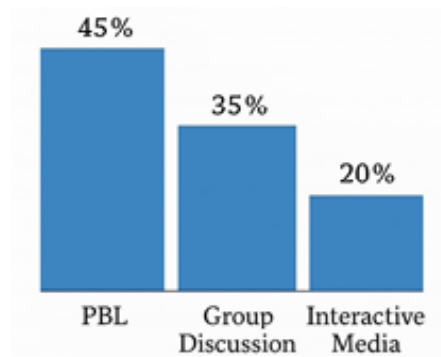
PBL strategy is one of the most widely adopted approaches in educational literature. PBL puts students at the center of the learning process through solving real problems, which requires them to think critically. In this approach, students work in groups to solve problems relevant to everyday life, encouraging them to conduct in-depth analysis, evaluate multiple perspectives, and develop solutions based on their understanding. By integrating the concepts of problem-based learning, PBL allows students to understand the subject matter and relate it to real situations, strengthening their critical thinking skills (Darwis et al., 2024). In addition, PBL also motivates students to take initiative in their learning and develop the collaborative skills necessary in a professional society.

Besides PBL, discussion-based learning has proven effective in developing critical thinking skills. In a discussion-first learning environment, students can exchange ideas, analyze arguments, and ask questions that challenge their assumptions. This approach promotes active interaction between students, encourages them to receive information passively, and actively analyze and evaluate it. Structured group discussions allow students to view problems from multiple perspectives, enriching their understanding of the material and encouraging them to think more critically (Frykholm, 2020). In this case, the teacher's role is as a facilitator who directs the discussion and asks questions that stimulate deeper thinking.

Interactive media is also an important part of developing critical thinking skills. Using technology in education, such as digital-based learning tools and interactive simulations, provides students with a more engaging and immersive experience. By using interactive media, students can engage in scenarios or simulated situations that require them to analyze, evaluate, and make decisions based on available information. This kind of technology expands the space for students to practice critical thinking skills in a more diverse and dynamic context (Herwati et al., 2021). For example, case-based simulations that allow students to experience roles in real-world situations and make decisions that impact the simulation outcome provide hands-on practice in critical thinking-based decision-making.

As such, teaching strategies that have proven effective in improving critical thinking skills include *Problem-Based Learning*, group-based discussions, and interactive media. All

three have a solid foundation in the existing literature, and each contributes to developing students' critical thinking skills differently. These strategies not only improve students' ability to think deeply but also prepare them to face the complex challenges of life in a more analytical and structured way (Ghafar, 2023). From the articles reviewed, we can see effective learning strategies for critical thinking in Figure 2.



**Figure 2.** Graph of Effective Learning Strategies for Critical Thinking

## 2. Most Frequently Applied Teaching Methods in Critical Thinking

The second stage discusses the most frequently applied teaching methods in the existing literature, focusing on approaches that have been proven effective in improving critical thinking skills (Qi et al., 2024). Among the various methods, *the flipped classroom* and *inquiry-based learning* (IBL) are two of the most widely applied and frequently discussed methods in research related to critical thinking skills development (Khadawardi et al., 2025). Both methods have shown significant impact in improving students' critical thinking skills, both in the context of learning in elementary, secondary, and higher education.

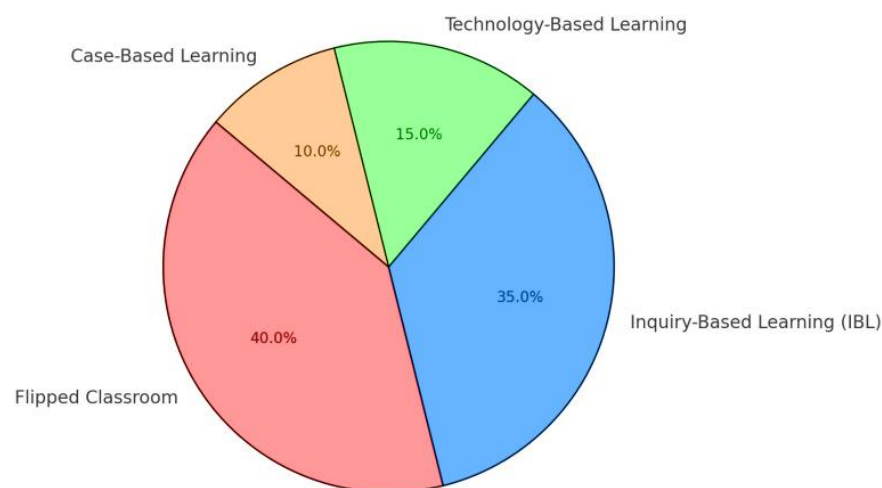
*The flipped classroom* is one of the most widely applied methods in various levels of education. In this model, traditional learning is flipped, where students study learning materials independently outside the classroom through learning videos or reading materials, and class time is used for interactive activities such as discussion, problem solving, or practical application of the material that has been learned (Widyaningrum, 2020). This allows students to explore the material in greater depth at their own pace, while utilizing class time to interact with their peers and discuss more complex topics. In this context, the teacher functions more as a facilitator who helps students develop their critical thinking skills through discussion activities, encouraging them to analyze, evaluate, and create their own knowledge. Research shows that implementing the *flipped classroom* improves students' critical thinking skills because they are actively involved in learning and can apply their knowledge in a more practical and applicable context (Divjak et al., 2022).

Besides *the flipped classroom*, the *inquiry-based learning* (IBL) method is often applied in the existing literature. IBL is an approach that encourages students to ask their questions, conduct research, and investigate problems independently or in groups (Sari, F. D. et al., 2023). This method emphasizes the process of inquiry, where students do not just receive

information from the teacher or textbook, but also actively seek answers to their questions through exploration and research. IBL develops students' critical thinking skills by encouraging them to evaluate information, consider multiple perspectives, and develop creative and evidence-based solutions. Some studies show that IBL can improve students' critical thinking skills because they engage in a deeper and more reflective learning process, allowing them to solve problems more structured and analytically (Yi et al., 2023).

Besides these two methods, another technique widely applied in the literature is using technology-based learning tools, such as computer-based simulation and case-based learning. Technology makes learning more dynamic and allows students to interact with content more directly and immersively (Herwati et al., 2021). The use of technology not only helps in understanding the material more deeply but also provides a space for students to practice critical thinking skills in various contexts.

Thus, the literature's most frequently applied teaching methods are the *flipped classroom* and *inquiry-based learning*, which focus on empowering students to think critically through independent and collaborative activities. Both methods reinforce students' active role in the learning process and help them develop critical thinking skills that are highly needed in both the academic and working worlds (Khadawardi et al., 2025). Based on the articles reviewed, we can find the most frequently applied teaching methods in critical thinking in Figure 2.



**Figure 2.** Diagram of Most Frequently Applied Teaching Methods in Critical Thinking

### 3. Application of the Method in Educational Contexts at Various Levels

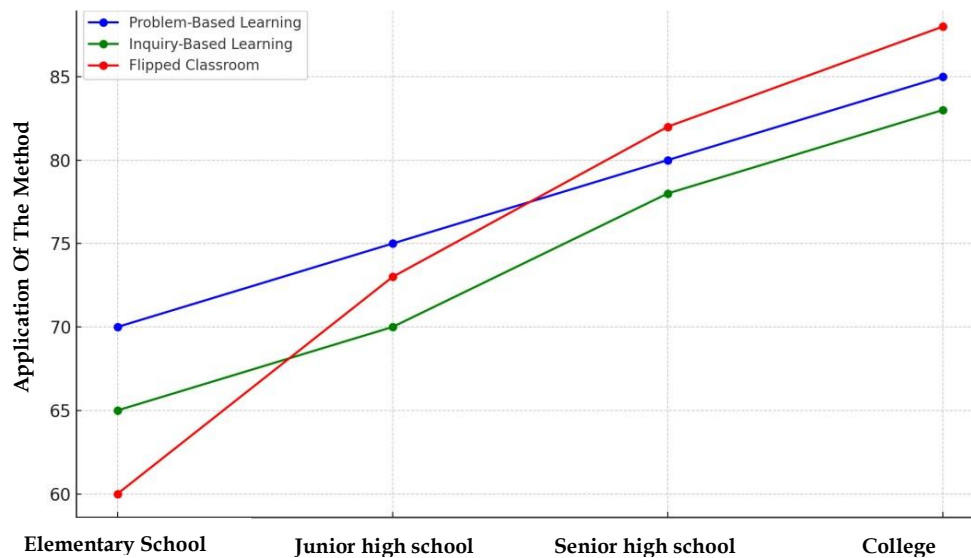
In the third stage, we will discuss applying these teaching methods in educational contexts at various levels. At the basic education level, approaches such as *Problem-Based Learning* (PBL) and *inquiry-based learning* have been applied to help students develop critical thinking skills through hands-on experience in solving real problems. For example, in primary schools, PBL is used to teach basic concepts such as science and math in a more

practical and applicable way. Students can collaborate in groups and solve problems related to their learning topics, improving their critical thinking skills (Frykholm, 2020). In addition, *inquiry-based learning* allows students to ask questions and seek the answers through simple experiments or research that hone their analytical skills.

Applying methods such as the *flipped classroom* and *inquiry-based learning* is becoming more common at the junior high and high school levels. In a *flipped classroom*, students are provided with learning materials through videos or reading materials before class, and class time is used for discussion, problem solving, or other practical activities that promote a deeper understanding of the material. This allows students to learn independently and then apply their knowledge in a more real-world context during class (Khadawardi et al., 2025). In high school, project-based learning and case-based simulations often encourage students to analyze fundamental problems and make decisions based on the evidence they collect. Here, the teacher's role as a facilitator is crucial in helping students to develop critical thinking skills through activities that motivate them to think more deeply and analytically (Yi et al., 2023).

At the college level, applying these methods is more advanced and involves the development of more complex critical thinking skills. In universities, the *flipped classroom* and *PBL* encourage students to think critically, creatively, and innovatively. Through problem-based projects, students can work in groups to solve real-world problems, which require them to conduct research, analyze multiple perspectives, and develop practical solutions (Darwis et al., 2024). In addition, using technology in learning, such as computer-based simulations and e-learning platforms, enriches students' learning experience and helps them develop critical thinking skills in a more global and digital context.

As such, applying these teaching methods is highly relevant and practical at various levels of education, from elementary school to college. Each level of education has an appropriate way to adapt these methods to the developmental needs of students' critical thinking skills. Applying the proper methods at each level of education can help students become more critical thinkers and be ready to face real-world challenges in the future (Tommasi et al., 2021). Based on the articles reviewed, we can find out the application of the most frequently used teaching methods at each level of education in critical thinking, in Figure 3.



**Figure 3.** Diagram of the Most Frequently Used Teaching Methods at Each Educational Level in Critical Thinking

## Discussion

In this section, we have identified some teaching strategies that have proven effective in improving students' critical thinking skills. The existing literature proposes various methods, including Problem-Based Learning (PBL), discussion-based learning, and interactive technology. From the analysis, it can be concluded that PBL is one of the most widely applied methods and proven effective in improving critical thinking skills (Darwis et al., 2024). PBL involves students in solving real problems, which forces them to analyze, evaluate, and develop solutions, all of which are important elements in critical thinking (Frykholm, 2020).

Discussion-based learning methods have also emerged as a highly effective strategy. In a discussion environment, students do not just passively receive information but actively analyze arguments and structure their thoughts. This approach encourages students to think critically and question existing assumptions, significantly deepening their understanding (Sari, Y. et al., 2023). However, while PBL and discussion have proven effective, interactive technology is equally important. Digital-based learning tools and interactive simulations provide students with a more immersive learning experience, allowing them to be more involved in the learning process and develop critical thinking skills in a more dynamic and applicable context (Herwati et al., 2021).

While methods such as PBL and discussion-based learning have proven effective, some challenges are faced in their implementation. One of the main challenges is the limited time available in the class schedule. In many cases, limited time in the classroom makes it difficult to maximize the implementation of active learning strategies such as PBL (Khadawardi et al., 2025). In addition, many teachers find it difficult to adapt this teaching

strategy to the established curriculum, which sometimes focuses more on achieving academic and quantitative learning objectives.

In addition, there are challenges in terms of teacher preparedness. Although many teachers recognize the importance of developing critical thinking skills, not all teachers have in-depth training or understanding of implementing these strategies effectively (Zapalska et al., 2020). Some research suggests that a lack of understanding and experience in using problem-based or inquiry-based approaches prevents many educators from implementing these methods adequately (Tommasi et al., 2021).

In addition, the application of technology in education to support the development of critical thinking skills can also encounter obstacles, especially related to the accessibility of technological devices and students' ability to operate these digital tools. Reliance on technology often adds difficulties for students who are less skilled in using these devices or for schools with digital infrastructure limitations (Herwati et al., 2021).

Teaching strategies that focus on developing critical thinking skills, such as PBL and group-based discussions, show positive results in the long run. In many studies, students who engaged in problem-based learning showed significant improvement in critical thinking skills compared to those who followed conventional learning (Darwis et al., 2024). Similarly, implementing the flipped classroom allows students to learn independently and deepen their understanding through class discussion and problem-solving. This allows them to connect theory with practice and enrich their understanding (Khadawardi et al., 2025).

In addition, the inquiry-based learning (IBL) technique has proven to be very effective in the long run, as students who engage in this method not only learn to think critically, but also develop the ability to seek solutions independently and work collaboratively with others (Sari, Y. et al., 2023). This method provides a solid foundation for students to become lifelong learners, capable of adapting to real-world challenges. This is particularly important in a rapidly changing and evolving world.

While these strategies have proven effective in improving critical thinking skills, their effectiveness depends on consistent and sustained implementation. In some contexts, long-term results may be affected by other variables, such as differences in educational culture and the education system's support for teaching change. Therefore, the government and educational institutions need greater commitment and support to ensure effective implementation of these methods (Ali et al., 2021).

The practical implications of this study's results are very important for educators and educational policymakers. First, educators need to be given adequate training on teaching strategies that focus on developing critical thinking skills. This training should include ways to integrate PBL, group-based discussions, and technology in their teaching to create a more dynamic and interactive learning environment (Divjak et al., 2022).

In addition, education policy should also support changes in teaching approaches that are more oriented towards developing critical thinking skills. This can be done by providing greater space for active teaching strategies in the curriculum and ensuring that

schools can access adequate technology to support technology-based learning (Herwati et al., 2021). In addition, policymakers also need to pay attention to the importance of evaluating the development of critical thinking skills, using clear rubrics to assess student progress (Johnson et al., 2022).

Implementing effective teaching strategies to improve critical thinking requires cooperation between educators, students, and policymakers. The success of teaching critical thinking will be more assured if there is strong support from all parties involved in education and a commitment to creating a learning environment that facilitates critical thinking, collaboration, and real-life application of knowledge. Learning that focuses on developing critical thinking skills prepares students to face academic challenges and become individuals capable of making thoughtful and informed decisions in everyday life.

#### **D. Conclusion**

Based on an in-depth review of various learning strategies aimed at improving critical thinking skills, it can be concluded that the Problem-Based Learning (PBL) and inquiry-based learning (IBL) approaches are the most effective methods in supporting the development of students' critical thinking skills. Both approaches encourage students' active involvement in identifying problems, evaluating information, and formulating relevant solutions. Implementing these strategies not only supports the improvement of students' analytical and reflective abilities but also strengthens their capacity to make decisions independently and responsibly. Thus, problem-based and inquiry-based learning strategies can significantly support achieving learning objectives that emphasize strengthening higher-order thinking skills.

The results of this synthesis provide important implications for the world of education, especially in designing more meaningful and contextualized learning. Teachers and educational institutions need to consider integrating PBL and IBL methods as part of the main strategies in learning, especially in curricula that demand developing critical thinking skills. At the primary school level, this approach can bridge theoretical understanding with students' concrete experiences. Meanwhile, this strategy can be enriched at the secondary and tertiary levels by applying the flipped classroom and interactive technology that further strengthens student engagement. Therefore, using problem-based and inquiry-based learning methods is believed to create a learning ecosystem that is adaptive to the needs of 21st-century students.

For future research development, it is suggested that the study should focus on evaluating the long-term implementation of PBL and IBL methods in various educational contexts, including schools with limited resources. In addition, future research could explore the effectiveness of these strategies in integration with digital platforms specifically designed to support problem-based learning. Another suggestion is to expand the research subjects across different cultures and national curricula to determine the extent to which the effectiveness of this approach can be applied universally. Thus, further studies can enrich

the understanding of the most appropriate teaching strategies in shaping a generation of critical and problem-solving learners.

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