International Journal of Academic Pedagogical Research (IJAPR)
ISSN: 2643-9123
Vol. 9 Issue 6 June - 2025, Pages: 273-277

A Scoping Review of Pedagogical Strategies for Fostering Critical Thinking in Junior High School Students

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Abstract: *This study presents a scoping review of literature on pedagogical strategies aimed at fostering critical thinking among junior high school students. Recognizing critical thinking as a foundational skill for academic success and lifelong learning, the review explores instructional approaches that have been implemented between 2015 and 2025 across various educational contexts. Guided by the methodological framework of Arksey and O'Malley (2005), the review followed five stages: identifying research questions, sourcing relevant literature, applying inclusion criteria, data charting, and thematic synthesis. A total of peer-reviewed articles, conference papers, and academic reports were analyzed using qualitative content analysis. The review identified five key themes: (1) inquiry-based learning, which encourages student-led exploration and questioning; (2) Socratic questioning and dialogic teaching, which promote analytical discourse; (3) technology integration, particularly digital tools that support interactive and reflective learning; (4) project-based learning, which situates critical thinking within real-world contexts; and (5) teacher professional development, emphasizing the educator's role in designing and facilitating critical thinking-rich environments. Findings reveal that while a variety of strategies are being employed, their effectiveness often depends on teacher capacity, contextual relevance, and instructional design. The review highlights both promising practices and gaps in the literature, particularly the need for more localized and longitudinal studies. This scoping review offers valuable insights for educators, curriculum designers, and policymakers aiming to integrate critical thinking more effectively into junior high school pedagogy.*

Keywords: Critical Thinking, Junior High School, Pedagogical Strategies, Scoping Review, Instructional Approaches, 21st-Century Skill

1. INTRODUCTION

Critical thinking is widely regarded as a cornerstone of 21st-century education, enabling students to analyze, evaluate, and synthesize information effectively in a rapidly evolving world. Across global education systems, there is increasing emphasis on equipping learners with higher order thinking skills that prepare them for lifelong learning, responsible citizenship, and complex problem solving (Hamzah et al., 2022). In junior high school, where learners transition from foundational knowledge to more abstract reasoning, fostering critical thinking becomes particularly essential (Wijnia et al., 2023). Numerous international frameworks and academic standards now identify critical thinking as a key learning outcome in basic education.

Despite the consensus on its importance, the integration of critical thinking into classroom practice remains a significant challenge for educators (Nussbaum et al., 2020). In many junior high school settings, instruction continues to emphasize rote memorization and standardized assessments, limiting opportunities for deeper cognitive engagement. Research has shown that the effective development of critical thinking relies heavily on the intentional use of pedagogical strategies that promote inquiry, reflection, dialogue, and application (Da Silva et al., 2024). However, the variability in how these strategies are implemented across contexts has led to inconsistencies in student outcomes and limited the scalability of best practices (Howard et al., 2018).

Moreover, existing studies on critical thinking often focus on higher education or general secondary education, with limited emphasis on junior high school learners (Zubaidah et al., 2017). There is also a lack of synthesized evidence that maps out which instructional methods have been most effective across diverse settings (Hunde and Arega, 2025) This gap in literature creates uncertainty for educators and policymakers seeking to adopt evidence-based practices for fostering critical thinking in early adolescence. A clearer understanding of the range of pedagogical strategies currently used and their documented impacts is urgently needed to inform practice and policy in junior high education (Bernardino, 2025).

To address this gap, this study undertakes a scoping review of literature published between 2015 and 2025, focusing specifically on pedagogical strategies designed to develop critical thinking among junior high school students. By mapping the existing body of research, this review aims to identify common instructional approaches, highlight successful interventions, and reveal gaps in current knowledge. Unlike systematic reviews, which often focus on narrowly defined questions, this scoping review adopts a broader lens to capture the scope, variety, and trends in literature (Munn et al., 2018).

The findings of this review will provide valuable insights for educators, researchers, and education leaders who are committed to enhancing instructional quality and student thinking outcomes. By identifying evidence-based strategies and areas for further research, this study contributes to the growing discourse on how schools can foster thoughtful, reflective, and critically engaged learners during one of the most formative stages of their academic journey.

2. METHODS AND PROCEDURE

This study employed a scoping review design guided by the methodological framework of Arksey and O'Malley (2005), which is widely recognized for its comprehensive and flexible approach to mapping key concepts in educational research. The scoping review method was selected to systematically explore the breadth and depth of existing literature on pedagogical strategies aimed at fostering critical thinking among junior high school students. Following the five-stage framework proposed by Arksey and O'Malley, the review began with the identification of research questions that guided the entire process. These questions were formulated to explore (1) the types of pedagogical strategies utilized in junior high school settings to enhance critical thinking, (2) the reported outcomes of these strategies, and (3) the trends and gaps within the literature. This stage ensured clarity in the review's scope and objectives.

In the second stage, a comprehensive search for relevant literature was conducted across academic databases and repositories such as Google Scholar, ERIC, and ResearchGate. The search was limited to peer-reviewed journal articles, conference papers, and relevant educational reports published between 2015 and 2025. The primary search terms included combinations of keywords such as "critical thinking," "pedagogical strategies," "junior high school," "middle school education," and "instructional approaches." Boolean operators and filters were applied to refine the search. The third stage involved the application of inclusion and exclusion criteria. To be included in the review, studies had to focus on junior high school (or equivalent middle school) learners, address critical thinking development explicitly, and discuss or evaluate specific instructional strategies. Each study was screened based on its abstract, introduction, methodology, and findings. Studies lacking empirical grounding or not addressing pedagogical interventions were excluded.

In the fourth stage, data from the selected articles were charted systematically using a matrix that captured key information such as authorship, publication year, country of origin, study objectives, methodology, pedagogical strategy employed and reported outcomes. This process facilitated the organization and comparison of diverse sources of evidence. Finally, the fifth stage involved synthesizing the data through qualitative content analysis. Emerging patterns, instructional trends, and thematic clusters were identified and organized into coherent themes to highlight the current landscape of pedagogical strategies used to foster critical thinking. The findings were interpreted considering the research questions, providing insights into effective practices and areas requiring further investigation.

3. RESULTS AND DISCUSSIONS

Pedagogical Strategies for Fostering Critical Thinking in Junior High School Students

Theme 1: Inquiry-Based Learning as a Catalyst for Critical Thinking

Inquiry-based learning emerged as a widely recognized strategy for promoting critical thinking in junior high school (Bishaw and Wale, 2020). This approach encourages students to ask questions, investigate real-world problems, and reflect on their findings. The review showed that when students are positioned as active participants in their learning, they tend to engage more deeply in analytical thinking, hypothesis formation, and evidence-based reasoning. Moreover, studies emphasized that structured inquiry where teachers guide students through the inquiry process yields more consistent gains in critical thinking than unguided exploration (Jatmiko et al., 2023). Teachers who scaffold inquiry activities effectively are better able to help students develop higher order thinking skills while also improving their academic achievement across disciplines (Setyaningrum et al., 2024).

Theme 2: Socratic Questioning and Dialogue-Rich Classrooms

Socratic questioning, characterized by open-ended, thought-provoking questions, was consistently identified as a powerful instructional practice in fostering critical thinking (Li et al., 2023). Research highlights how classroom discussions encourage students to defend their reasoning, consider alternative perspectives, and question assumptions lead to improved analytical and reflective thinking.

Additionally, a culture of respectful dialogue and collaborative meaning-making was found to contribute to deeper understanding and critical engagement (Tong and Ding, 2024). Junior high school learners, when exposed to dialogic teaching, developed the ability to

construct arguments, assess information critically, and engage in meaningful discourse skills that are transferable beyond the classroom (Sedlácek et al., 2016).

Theme 3: Integration of Technology to Support Critical Thinking Development

Technology, when meaningfully integrated, was found to support the development of critical thinking skills through interactive platforms, simulations, and collaborative tools (Meirbekov et al., 2022). Digital learning environments that promote problem-solving, peer interaction, and real-time feedback were particularly effective in enhancing student engagement and reasoning capabilities (Abusaimeh et al., 2025). The review also found that educational apps and digital games, when aligned with instructional goals, can stimulate critical thought by challenging students to analyze scenarios, make decisions, and reflect on outcomes. However, the success of such interventions largely depends on how well teachers are trained to incorporate these tools within a pedagogically sound framework (Carter and Brock, 2017).

Theme 4: Project-Based Learning and Real-World Relevance

Project-based learning (PBL) was frequently highlighted as a strategy that nurtures critical thinking by situating learning in real world contexts (Wang, 2022). Through long-term projects, students are encouraged to identify problems, conduct research, develop solutions, and present their findings (Cabezas et al., 2021). These tasks require planning, collaboration, and evaluation of key components of critical thinking. Findings indicated that PBL environments empower junior high school students to connect classroom content to real life issues, making learning more meaningful and impactful. Additionally, the interdisciplinary nature of many projects fosters a more holistic form of thinking that transcends subject boundaries and encourages learners to think critically across domains (Melin et al., 2021).

Theme 5: Teacher Professional Development and Instructional Design

Teacher preparedness was a recurring theme influencing the effectiveness of critical thinking instruction (Panganoron-Jabonete, 2022). Studies stressed the importance of ongoing professional development that equips educators with the tools, strategies, and confidence needed to design critical thinking rich lessons (Leibovitch et al., 2024). Teachers who receive targeted training are more likely to implement reflective questioning, active learning, and feedback-oriented practices. Furthermore, the review emphasized that instructional design plays a crucial role in fostering critical thinking. Lessons that are clearly structured, cognitively challenging, and centered on student inquiry were found to significantly enhance critical thinking outcomes (Sutiani et al., 2021). Thus, the teacher's role as both facilitator and instructional designer is essential in cultivating a critical thinking culture in junior high school classrooms.

4. CONCLUSIONS AND RECOMMENDATIONS

The findings of this scoping review reveal that a diverse range of pedagogical strategies such as inquiry-based learning, Socratic questioning, project-based learning, and technology integration have been effectively utilized to foster critical thinking skills among junior high school students. These approaches consistently emphasize active student engagement, reflective thinking, and real-world application of knowledge. The review also highlights the critical role of well-designed instructional practices and ongoing teacher professional development in creating learning environments that nurture critical thinking. However, despite the growing body of literature, notable gaps remain, particularly in terms of localized studies, longitudinal evaluations, and cross-disciplinary strategies that link critical thinking to subject-specific outcomes.

Considering these findings, it is recommended that educators and curriculum developers integrate critical thinking objectives explicitly into lesson plans and learning outcomes across subjects. Schools should invest in continuous teacher training programs that equip educators with evidence-based strategies for facilitating higher-order thinking. Furthermore, future research should explore context-specific practices, especially within underrepresented regions, to ensure that critical thinking development is both inclusive and culturally responsive. Educational policymakers are also encouraged to support initiatives that prioritize critical thinking as a core competency, recognizing its essential role in preparing students for complex real-world challenges.

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