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The use of active learning methods in developing critical thinking skills among elementary school students

Uso de metodologías activas en el desarrollo del pensamiento crítico en estudiantes de educación básica

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ABSTRACT

The study aimed to analyze the use of active methodologies in the development of critical thinking among elementary school students within the context of an emerging curriculum in Ecuador. It was a descriptive, literature-based study conducted through the analysis of 16 scholarly references. Eight active methodologies with empirical support were identified: collaborative learning, STEM integration, ICT-mediated learning, game-based learning, scientific inquiry, deep learning, algorithmic thinking, and task-based learning. Based on this, an emerging curriculum plan was formulated, structured around five methodological pillars and four modalities of authentic assessment. It is concluded that the systematic articulation of active methodologies within a coherent curricular framework constitutes the pedagogical condition that enables the sustained development of critical thinking in Ecuadorian basic education.

Descriptors: educational planning; educational innovation; educational trends. (Source: UNESCO Thesaurus).

RESUMEN

El estudio tuvo por objetivo analizar el uso de metodologías activas en el desarrollo del pensamiento crítico en estudiantes de educación básica para una concepción curricular emergente en Ecuador. De tipo descriptivo documental, mediante el análisis de 16 referencias bibliográficas. Se identificaron ocho metodologías activas con respaldo empírico, aprendizaje colaborativo, integración STEM, mediación con TIC, aprendizaje basado en juegos, indagación científica, aprendizaje en profundidad, pensamiento algorítmico y aprendizaje basado en tareas; a partir de ello, se formuló un plan curricular emergente articulado en cinco ejes metodológicos y cuatro modalidades de evaluación auténtica. Se concluye que la articulación sistemática de metodologías activas, dentro de un marco curricular coherente, constituye la condición pedagógica que posibilita el desarrollo sostenido del pensamiento crítico en la educación básica ecuatoriana.

Descriptores: planificación de la educación; innovación educacional; tendencia educacional. (Fuente: Tesauro UNESCO).

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Research articles

INTRODUCTION

Education in the 21st century faces cognitive demands that go beyond the simple memorization and reproduction of content; instead, it requires the development of citizens capable of analyzing, evaluating, and transforming the information circulating in increasingly complex and digitized environments; In this context, critical thinking emerges as an indispensable cross-curricular competency, the development of which must begin in the early years of basic education, since it is during this stage that students' cognitive frameworks are most malleable.

Consequently, active learning methodologies constitute, in this scenario, a pedagogically grounded response to the limitations of the traditional transmissive model; in this sense, their essence lies in positioning the student as the protagonist of the learning process, mobilizing their capacities for inquiry, argumentation, and reflection; as noted by Walker (2003) and Mejía-Coello et al. (2026), in this way; the student's active participation not only enhances knowledge retention but also activates metacognitive processes that form the basis of critical thinking; similarly.

In line with the above, this study examines how Ecuador is currently undergoing a period of educational reforms that highlight the need to update the basic education curriculum in response to the challenges of the present century; within this framework, the current legal system—aligned with the Constitution of the Republic and the Organic Law on Intercultural Education (LOEI)—recognizes the development of critical thinking as a priority educational goal; however, pedagogical practice in classrooms continues to reveal gaps between normative discourse and the reality of classroom instruction, which is characterized by the predominance of passive, teacher-centered strategies.

Therefore, and in line with the above, the research objective is to analyze the use of active methodologies in the development of critical thinking among elementary school students to foster an emerging curricular approach in Ecuador.

Critical Thinking in Elementary Education

Critical thinking has been conceptualized in many ways throughout the history of education; however, there is a growing consensus regarding its multidimensional nature, which encompasses skills such as analysis, synthesis, evaluation, inference, and self-regulation of one's own reasoning; According to Khasanova (2025), the development of these skills in elementary school students is not a spontaneous process but rather requires intentional and systematic pedagogical interventions that challenge students to go beyond a superficial understanding of the content.

In elementary education, the development of critical thinking takes on particular significance, given that children are in a stage of cognitive transition in which concrete operations begin to give way to more abstract forms of reasoning; In this regard, Masithoh et al. (2025) documented that the profile of critical thinking skills among elementary school students is heterogeneous and strongly influenced by the learning environment, which highlights the teacher's responsibility in creating conditions that encourage questioning, reasoned doubt, and the collaborative construction of knowledge.

METHOD

Given that the research objective required the systematization of previously published scientific works, the study was conducted within the qualitative paradigm using a descriptive documentary design. It should be noted that this approach allowed for the interpretation of the bibliographic corpus without intervening with subjects or collecting primary data in the field. Consequently, the unit of analysis comprised 16 bibliographic references selected from the time period spanning 2003 to 2026.

Data processing was organized through a bibliometric analysis aimed at characterizing the documentary corpus based on variables such as year of publication, the authors' country of origin, the type of active methodology

addressed in each study, the research design employed, and the databases in which each source was indexed. Furthermore, the results derived from this bibliometric analysis were subjected to a qualitative and interpretive review, with the aim of identifying points of convergence or divergence in their approaches and, above all, thematic gaps that the literature has not yet adequately addressed.

RESULTS

A bibliometric analysis is presented based on the references reviewed:

Table 1. *Bibliometric summary of the analyzed document corpus.*

Year	Author(s)	Country	Active Methodology	Study Type
2003	Walker	United States	General active learning	Theoretical review
2022	Ramdani et al.	Indonesia	Collaborative learning	Meta-analysis
2023	Campo et al.	Spain	Multiple methodologies	Empirical review
2023	Narváez-Pérez	Costa Rica	Task-based learning	Literature review
2023	Román-Celi	Ecuador	Game-based learning	Descriptive study
2024	Dewi Setianingsih et al.	Indonesia	ICT-supported web-based learning	Research and development study
2024	Susanti	Indonesia	Multiple strategies	Descriptive study
2024	Varas-Rivera	Peru	Learning community	Descriptive study
2024	Wong et al.	Hong Kong	Algorithmic thinking	Mixed-method case study
2025	Andini Rahmawati	Indonesia	STEM integration	Experimental study
2025	de los Santos et al.	Mexico	Scientific thinking	Experimental study
2025	Khasanova	Kazakhstan	Cognitive strategies	Descriptive study
2025	Masithoh et al.	Indonesia	Skills profile	Descriptive study
2025	Sudarmono et al.	Indonesia	Deep learning	Experimental study
2026	León-Díaz et al.	Colombia	ICT-mediated learning	Systematic review
2026	Mejia-Coello et al.	Ecuador	Active learning strategies	Quasi-experimental study

Note: Prepared by the author based on the analyzed document corpus.

Table 1 lists the 16 studies that make up the corpus of this research, published between 2003 and 2026; their temporal, geographic, and methodological distribution is described below.

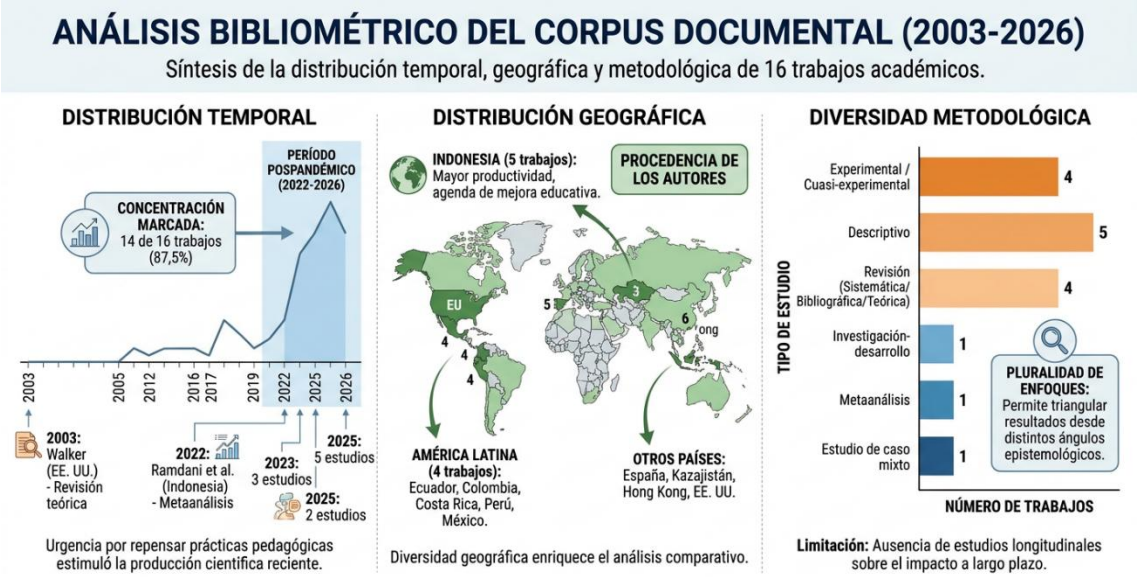

Figure 1. *Bibliometric analysis of the document corpus (N=16). Based on Table 1. Nano Banano Pro.*

With reference to Figure 1, a chronological analysis of the documentary corpus reveals a concentration in the 2022–2026 period, during which fourteen of the sixteen selected works were published, representing 87.5% of the identified output; this temporal pattern cannot be attributed to chance, since the post-pandemic scenario compelled the international scientific community to reconsider the foundations of pedagogical practices, which triggered a wave of research focused on active methodologies and their impact on students' cognitive development; It should be noted that two studies fall outside this timeframe: similarly, Walker (2003) retains its relevance due to the consistency of its conceptual framework on active learning and critical thinking, while Ramdani et al. (2022) served as a bridge between the preceding literature and the most recent scientific output, establishing an argumentative continuity that justifies their inclusion in the analysis.

In this regard, the authors' institutional affiliations bring together researchers from various regions of the world; it is worth noting that Indonesia is the most productive country within the corpus, with five contributions, namely: Andini Rahmawati (2025), Dewi Setianingsih et al. (2024), Masithoh et al. (2025), Ramdani et al. (2022), and Sudarmono et al. (2025), which demonstrates a

sustained educational improvement agenda focused primarily on basic education; Likewise, Latin America contributes four studies, including those by Mejia-Coello et al. (2026), Narváez-Pérez (2023), Román-Celi (2023), and Varas-Rivera (2024), with Ecuador and Colombia being the countries directly represented in the regional debate on active teaching strategies; At the same time, Spain, Mexico, Costa Rica, Peru, Kazakhstan, and Hong Kong round out a diverse research landscape that enhances the comparative scope of the reviewed body of literature.

Viewed in this light, the geographical breadth of the corpus is complemented by an equally significant methodological variety; The corpus includes experimental and quasi-experimental studies, systematic and literature reviews, descriptive profile studies, research on educational technology development, and a meta-analysis, collectively forming a remarkably rich epistemological map; given that this diversity of designs enables the triangulation of results from complementary analytical perspectives, the interpretive validity of the body of research is strengthened; however, this variety also highlights the absence of longitudinal studies that track the impact of active methodologies on critical thinking across multiple school years, which constitutes a structural limitation of the field that this research explicitly acknowledges and addresses.

DISCUSSION

The review of the corpus begins with the earliest reference in the collection, Walker (2003), who examines how active strategies relate to critical thinking. His work argues that practices such as debate, case studies, and cooperative learning set in motion processes of evaluative reasoning that go far beyond the simple memorization of content. This conceptual foundation directly supports the methodological framework that underpins the objective of this research. It should be noted, however, that Walker does not address basic education nor does he propose curricular criteria; therefore, his contributions must be carefully adapted to the Ecuadorian context analyzed here.

On the empirical level, Ramdani et al. (2022) provide quantitative evidence on collaborative learning through a meta-analysis focused on the biological sciences. Their findings confirm that this approach generates measurable effects on critical thinking, creative thinking, and metacognitive skills across different educational levels, thereby validating one of the most frequently cited active strategies in this research. However, given its disciplinary focus and its grounding in higher education levels, caution is advised when extrapolating its conclusions to the field of general basic education.

In a complementary vein, Campo et al. (2023) address the issue from the perspective of university students themselves, gathering their assessments of the strategies they perceive as most effective for stimulating critical thinking. Their empirical review confirms that active participation, argumentative discussion, and teamwork top these assessments. Since the sample comes from higher education, the direct transferability of the results is limited; nevertheless, its usefulness for this study lies in the fact that it serves as a comparative benchmark and foreshadows the type of critical thinking that elementary students will need to develop in later stages.

Closer to the school level of interest here, Narváez-Pérez (2023) reviews the literature on the task-based teaching approach applied to critical thinking in elementary school. Their work argues that authentic tasks create favorable conditions for evaluative reasoning and provides evidence of their relevance in Latin American contexts, which reinforces their applicability to the Ecuadorian curriculum proposal. However, his analysis is limited to the Costa Rican context and does not go so far as to formulate guidelines for institutional curriculum design—a gap that this research aims to address.

Within the national context, Román-Celi (2023) studies game-based learning as an active strategy geared toward critical thinking, which brings it geographically closest to the objective of this study. Their data show that structured educational games strengthen analysis, evaluation, and decision-making skills in elementary

school students. Unlike more theoretical sources, this study offers evidence grounded in the Ecuadorian context, which justifies its incorporation into the emerging curriculum proposal.

From a technological perspective, Dewi Setianingsih et al. (2024) design and evaluate a learning environment based on Google Sites to strengthen critical thinking and digital literacy among fifth-grade elementary students in Indonesia. Their study shows that technology can serve as an effective support for active learning methodologies in elementary education, and the digital dimension it introduces aligns with the demands of an emerging curriculum that cannot remain detached from the technological transformation currently reshaping educational institutions. The Indonesian cultural and institutional context, however, differs significantly from the conditions of the Ecuadorian education system; therefore, their results should be interpreted as general guidance rather than as directly transferable evidence.

With a broader scope, Susanti (2024) systematizes strategies for developing critical thinking in school-age children, organizing them according to their cognitive, social, or technological focus. This taxonomy is useful for guiding the selection and sequencing of active methodologies within a curriculum design, a function that aligns it with the objective of this research. Nevertheless, its scope is primarily descriptive: it lacks experimental data and does not estimate the effect size of the strategies it describes, which reduces its evidential power compared to experimental sources.

At the institutional level, Varas-Rivera (2024) examines the professional learning community as a mechanism for fostering critical thinking in students. His approach notes that critical thinking does not arise spontaneously but requires an institutional culture that continuously supports it. Indirect curricular implications follow from this, as any pedagogical intervention plan must address the school's organizational environment. His primary unit of analysis, however, is teachers and

their continuing professional development, not elementary school students, which shifts the focus away from the central objective of this study.

For their part, Wong et al. (2024) explore a less-traveled path by demonstrating, through a mixed-methods case study, that algorithmic thinking and computational problem-solving share cognitive structures with critical thinking, while skills such as detecting errors, formulating hypotheses, and verifying solutions in an orderly manner appear to be common to both forms of reasoning; this correspondence opens the possibility of integrating critical thinking with digital competencies into the curriculum, which is valuable for a contemporary educational approach. The sample, however, is located in Hong Kong, a context whose technological profile differs significantly from that of elementary schools in Ecuador.

Returning to the elementary education level, Andini Rahmawati (2025) evaluates STEM integration as a strategy for improving critical thinking in elementary school through an experimental design. Her data provide quantitative evidence on the effects of this methodology at that level, and the interdisciplinary nature of the approach aligns with an emerging curriculum that seeks to overcome subject-based fragmentation; however, the study is rooted in the Indonesian context and does not consider mechanisms for transfer to other educational systems, so caution is advised when applying its conclusions to the Ecuadorian context.

Along the same lines, de los Santos et al. (2025) demonstrate that teaching scientific thinking fosters critical thinking among elementary school students in Mexico; their experimental design allows for the establishment of causal links between the applied methodology and improvements in critical reasoning skills; and the Latin American context facilitates the transfer of these findings to the Ecuadorian context. Their proposal, however, does not incorporate a comprehensive curriculum design, as it is limited to a one-time instructional intervention—a gap that this research seeks to fill.

Consequently, from a cognitively and culturally more distant perspective, Khasanova (2025) addresses critical thinking in elementary school based on

strategies applied in Kazakhstan; her work identifies that skills such as asking questions, analyzing assumptions, and evaluating arguments hold interesting potential for transfer across diverse cultural contexts. Even so, the geographical and cultural distance from Ecuador is considerable, and the descriptive nature of the study limits the depth of the inferences that can be drawn from its results.

Complementing the above, Masithoh et al. (2025) offer a diagnostic portrait of the current level of critical thinking skills among elementary school students, identifying the areas where they exhibit the greatest weaknesses; therefore, this diagnostic foundation justifies the need for curriculum-based interventions focused on critical thinking starting in elementary school, which aligns their contribution with the objective of this research; however, their study neither proposes nor evaluates active methodologies as a means of improvement; it is limited to characterizing the current state, a function that makes it a descriptive starting point rather than evidence of effectiveness.

Building on this diagnostic foundation, Sudarmono et al. (2025) move toward an experimental evaluation of deep learning among elementary school students in Indonesia, reporting significant improvements in critical thinking through a design that allows for the establishment of causal relationships. It can be noted that this active approach invites a rethinking of curriculum designs that prioritize memorization over comprehension—a consideration relevant to the proposal put forward by this research. However, the study's contextual dependence is marked: both its Indonesian context and the absence of transfer mechanisms limit the direct applicability of its results in Ecuador.

From Latin America, León-Díaz et al. (2026) review the use of ICT as a pedagogical tool in the development of critical thinking in basic education, based on studies from Colombia and other settings in the region. In this regard, their systematic review identifies the institutional and technological conditions that favor the effectiveness of technology-mediated active methodologies; given that it operates at the same educational level and in a geographically close context, it

constitutes one of the most directly applicable references for the Ecuadorian curriculum proposal; however, its focus is limited to the technological dimension, which leaves non-digital active strategies out of consideration.

In conclusion, Mejia-Coello et al. (2026) provide the reference with the closest contextual relevance, as they study the effect of active teaching strategies on critical thinking in the upper grades of basic education in Ecuador, yielding positive and statistically significant results. Therefore, their contribution empirically validates, within the national context itself, the hypothesis underlying this study. Their proposal, however, lacks a curriculum design component that systematizes the implementation of these strategies—a gap that this research seeks to address by formulating an emergent curriculum plan tailored to the Ecuadorian context.

Table 2. *Theoretical and regulatory foundations of the emerging curriculum.*

Framework	Description	Supporting Authors
Active learning	Proposes that students' cognitive engagement is not a consequence of learning but its starting point; when students actively participate in knowledge construction, the necessary conditions emerge for critical thinking to develop as a sustained competence.	Walker (2003); subsequent studies consolidating the active learning approach.
Sociocultural constructivism	Recognizes that knowledge is not constructed individually; dialogue, peer collaboration, and teacher mediation are the mechanisms through which students organize, challenge, and deepen their understanding of the world.	Ramdani et al. (2022); Varas-Rivera (2024).
Expanded STEM approach	Integrates scientific inquiry, technological problem solving, and mathematical reasoning as complementary pathways for developing higher-order cognitive skills, without being restricted to a single disciplinary area.	Andini Rahmawati (2025); de los Santos et al. (2025).
Ecuadorian legal framework	The plan is aligned with the educational purposes established in Article 2 of the Organic Law on Intercultural Education (LOEI), which identifies critical thinking, creativity, and responsible citizenship as core goals of the national education system, as well as with the performance-based learning standards issued by the Ecuadorian Ministry of Education.	Organic Law on Intercultural Education (LOEI, 2011); curriculum guidelines of the Ministry of Education of Ecuador.

Note. Prepared by the author based on the analyzed document corpus.

Viewed in this light, Table 2 organizes the pillars of the emerging curriculum proposal based on a logic of progressive complementarity among its three theoretical frameworks. Thus, active learning positions the student as an agent in the educational process; sociocultural constructivism assigns the relational environment the role of a scaffold that supports that agency; and the expanded STEM approach, for its part, provides the specific disciplinary domains in which

that participation becomes cognitively demanding. It should be noted that none of the three frameworks operates in isolation in pedagogical practice, as the interventions documented in the corpus integrate elements from all three approaches in their design. The incorporation of the Ecuadorian legal framework therefore responds to a condition of institutional feasibility: a curriculum proposal that does not align with the LOEI and the guidelines of the Ministry of Education would lack the regulatory foundation necessary for its implementation in classrooms across the country.

Table 3. *Curricular objectives of the emerging plan.*

No.	Objective	Development Dimension	Supporting References
1	Strengthen basic education students' ability to analyze, question, and evaluate information from diverse sources based on logical and epistemological criteria appropriate to their developmental level.	Cognitive	Masithoh et al. (2025); Khasanova (2025).
2	Promote the collaborative resolution of complex problems through active methodologies involving inquiry, evidence-based argumentation, and informed decision-making in meaningful learning situations relevant to students' contexts.	Social and cognitive	Ramdani et al. (2022); de los Santos et al. (2025).
3	Strengthen teachers' capacities to design, implement, and assess active pedagogical experiences that foster critical thinking in basic education classrooms, with relevance to the Ecuadorian sociocultural context.	Professional and pedagogical	Varas-Rivera (2024); Mejia-Coello et al. (2026).

Note. Prepared by the author based on the analyzed document corpus.

Table 3 presents the plan’s three objectives arranged in a sequence that progresses from the individual to the collective and from the pedagogical to the institutional; the first objective focuses on the student as an individual who develops analytical and evaluative skills, using as a reference the critical thinking profiles characterized by Masithoh et al. (2025) and Khasanova (2025), who precisely identified the dimensions in which elementary students exhibit the greatest weaknesses; the second objective broadens the focus to peer interaction and problem-solving in authentic contexts, which requires methodologies that engage both the cognitive and social dimensions of learning, as documented by Ramdani et al. (2022) and de los Santos et al. (2025); the third

objective acknowledges that no pedagogical reform can succeed if teachers lack the conceptual and practical tools to sustain it, which is why Varas-Rivera (2024) and Mejia-Coello et al. (2026) provide empirical support for a dimension of the plan that is often left out of conventional curriculum designs; that being the case, the three objectives are not parallel but interdependent, since the achievement of each one determines the viability of the others.

Table 4. *Methodological pillars of the emerging curriculum.*

Axis	Operational Description	Curricular Areas of Application	Supporting References
1. Integrated scientific inquiry	Students formulate research questions, design simple experiments, collect data, and communicate conclusions. Instructional sequences connect curricular content with real-world problems from the local environment, providing learning with a meaningful socio-environmental context.	Natural Sciences; Social Studies	de los Santos et al. (2025).
2. Structured collaborative learning	Students work in heterogeneous teams to solve cognitively demanding tasks through strategies such as the jigsaw technique, group investigation, and academic debate, integrated into interdisciplinary projects.	Language and Literature; Mathematics; Social Studies	Ramdani et al. (2022); Varas-Rivera (2024).
3. Critical digital mediation	ICT is incorporated not merely as an instructional tool but as a learning environment in which students evaluate digital information, create collaborative content, and develop digital citizenship competencies. Activities include wikis, discussion forums, and argumentative presentations using platforms accessible within the Ecuadorian educational context.	Cross-curricular (all subject areas)	León-Díaz et al. (2026); Dewi Setianingsih et al. (2024).
4. Game-based and algorithmic learning	Educational games and computational thinking are integrated to foster strategic decision-making, pattern recognition, and process refinement. Activities range from role-playing games with adaptable rules to visual programming using tools such as Scratch.	Mathematics; Technology and Innovation	Román-Celi (2023); Wong et al. (2024).
5. Authentic task-based learning	Learning tasks replicate real-life situations, require the integration of knowledge from multiple disciplines, and culminate in tangible communication products (reports, posters, oral presentations, and models) that demonstrate students' levels of understanding and argumentation.	Language and Literature; Social Studies; Natural Sciences	Narváez-Pérez (2023); Susanti (2024).

Note. Prepared by the author based on the analyzed document corpus.

Viewed in this light, Table 4 outlines the five methodological pillars that form the backbone of the plan; their selection is directly based on the evidence accumulated in the analyzed corpus. Since each pillar is interconnected with the

others, the set does not constitute a list of independent techniques; its purpose is to address the three dimensions of learning that Susanti (2024) identified as determinants of critical thinking: the cognitive, social, and technological dimensions. Thus, integrated scientific inquiry and authentic task-based learning address the cognitive dimension by placing students in situations that require independent reasoning and reasoned communication.

Likewise, critical digital mediation and playful, algorithmic learning address the technological dimension by integrating digital and computational environments as spaces where students practice transferable analytical skills. It should be noted that the distribution across curricular areas does not imply that each pillar is confined to a single subject; the interdisciplinary nature of the proposal requires teachers to coordinate their lesson plans so that active learning strategies are implemented consistently and continuously throughout the curriculum.

Table 5. *Assessment modalities of the emerging curriculum plan.*

Assessment Modality	Description	Critical Thinking Dimension Assessed	Supporting References
Analytic rubrics	Instruments designed to assess the coherence of students' arguments, the quality of the evidence they use, and their ability to consider alternative perspectives when addressing the same problem or situation.	Argumentation; analysis; source evaluation	Masithoh et al. (2025).
Learning portfolio	A cumulative collection of students' work throughout the academic year that documents the development of reflective skills and highlights the process-oriented nature of critical thinking, which is not always evident in isolated assessment products.	Reflection; self-regulation; progressive development	Campo et al. (2023).
Peer assessment and self-assessment	Engages students in evaluating their own learning processes, fostering metacognition and self-regulation. In this sense, self-assessment is not merely a measurement tool but also a learning strategy that directly contributes to the development of the competency being assessed.	Metacognition; self-regulation; reflective thinking	Khasanova (2025); Campo et al. (2023).

Assessment Modality	Description	Critical Thinking Dimension Assessed	Supporting References
Performance tasks	Students apply their analytical skills to novel situations, allowing educators to determine whether critical thinking is transferred beyond the original learning context. Such transfer is regarded as the most robust indicator of the genuine consolidation of this competency.	Transfer; application; reasoning in novel contexts	de los Santos et al. (2025); Mejia-Coello et al. (2026).

Note. Prepared by the authors based on the analyzed documentary corpus.

Table 5 presents the authentic assessment system that accompanies the emerging curriculum; its design is based on a recognition consistently highlighted in the literature: assessing critical thinking with conventional single-answer or memorization-based instruments is epistemologically incoherent, given that this competency manifests itself in processes, not in closed-ended answers; Consequently, the four proposed modalities complement one another in such a way that none of them alone can capture the complexity of what is being assessed; the analytical rubrics provide shared and transparent criteria that guide both student work and teacher assessment.

CONCLUSION

Supported by the reviewed evidence that active methodologies are not a passing pedagogical fad, but rather approaches with proven empirical support for stimulating critical thinking in elementary school students; the sixteen studies agreed that strategies such as collaborative learning, scientific inquiry, critical digital mediation, and authentic task-based learning yield positive improvements in students' analytical, evaluative, and metacognitive skills, thereby supporting the relevance of the emerging curriculum.

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CONFLICT OF INTEREST

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REFERENCES

Andini Rahmawati. (2025). Integrating STEM-based learning to improve critical thinking skills among elementary school students. *Proceeding International Conference of Innovation,* *5*(1), 728–739. https://doi.org/10.62951/icistech.v5i1.171

Campo, L., Galindo-Domínguez, H., Bezanilla, M.-J., Fernández-Nogueira, D., & Poblete, M. (2023). Methodologies for fostering critical thinking skills from university students' points of view. *Education Sciences, 13*(2), 132. https://doi.org/10.3390/educsci13020132

de los Santos, O., Hernández-Padilla, E., Vázquez-Alonso, Á., López-Aymes, G., Aguilar-Tamayo, M. F., & Arce, E. (2025). Scientific thinking promotes the development of critical thinking in primary education. *Education Sciences, 15*(9), 1174. https://doi.org/10.3390/educsci15091174

Dewi Setianingsih, Siswono, T. Y. E., & Yumiati. (2024). Development of web-based learning media (Google Sites) to improve critical thinking skills and digital literacy of Grade V elementary school students. *ELSE (Elementary School Education Journal): Jurnal Pendidikan dan Pembelajaran Sekolah Dasar, 8*(2). https://doi.org/10.30651/else.v8i2.23179

Khasanova, A. (2025). Developing critical thinking skills in primary school students. *American Journal of Education and Learning, 3*(5).

León-Díaz, F., Boude, O., & Vargas-Sanchez, A. (2026). Pedagogical mediation with ICT for the development of critical thinking in primary education: A systematic review. *Thinking Skills and Creativity, 60*, 102085. https://doi.org/10.1016/j.tsc.2025.102085

Masithoh, S., Widodo, W., & Mustaji. (2025). Profile of critical thinking skills in elementary school students. *Journal of Innovation and Research in Primary Education, 4*(3), 929–937. https://doi.org/10.56916/jirpe.v4i3.1469

Mejia-Coello, C. J., Mariscal-Contreras, C. E., Caicedo-Rivera, M. A., & Gastezzi-Tapia, M. E. (2026). Influence of active teaching strategies on the critical thinking of upper elementary students. *Prisma Journal, 2*(2), 221–234. https://doi.org/10.63803/prisma.v2n2.19

Narváez-Pérez, E. (2023). Habilidades de pensamiento crítico en personas estudiantes de primaria y el enfoque de enseñanza basado en tareas: una revisión bibliográfica *[Critical thinking skills in primary school students and the task-based teaching approach: A bibliographic review]*. *Revista Educación, 47*(1), 547–562. https://doi.org/10.15517/revedu.v47i1.49921

Ramdani, D., Susilo, H., Suhadi, & Sueb. (2022). The effectiveness of collaborative learning on critical thinking, creative thinking, and metacognitive skill ability: Meta-analysis on biological learning. *European Journal of Educational Research, 11*(3), 1607–1628. https://doi.org/10.12973/eu-jer.11.3.1607

Román-Celi, G. E. (2023). Aprendizaje basado en juegos (GBL) en el desarrollo del pensamiento crítico *[Game-based learning (GBL) in the development of critical thinking]*. *Cognopolis. Revista de Educación y Pedagogía, 1*(3), 1–14. https://doi.org/10.62574/5m9rgk11

Sudarmono, M. A., Hasan, & Halima. (2025). Deep learning approach in improving critical thinking skills of elementary school students. *Jurnal Penelitian Pendidikan IPA, 11*(8), 60–70. https://doi.org/10.29303/jppipa.v11i8.11708

Susanti, R. (2024). Effective strategies in developing critical thinking skills in elementary school age children. *West Science Interdisciplinary Studies, 2*(4), 732–736. https://doi.org/10.58812/wsis.v2i04.785

Varas-Rivera, S. M. (2024). Comunidad de aprendizaje profesional y pensamiento crítico en estudiantes *[Professional learning community and critical thinking in students]*. *Revista Multidisciplinaria Perspectivas Investigativas, 4*(1), 29–37. https://doi.org/10.62574/rmpi.v4i1.97

Walker, S. E. (2003). Active learning strategies to promote critical thinking. *Journal of Athletic Training, 38*(3), 263–267.

Wong, G. K. W., Jian, S., & Cheung, H. Y. (2024). Engaging children in developing algorithmic thinking and debugging skills in primary schools: A mixed-methods multiple case study. *Education and Information Technologies, 29*, 16205–16254. https://doi.org/10.1007/s10639-024-12448-x

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