

A Comparative Analysis of the Effectiveness of Socratic Dialectic, Cartesian Analysis, and Spinozist Synthesis in the Philosophy for Students Program for Strengthening Cognitive Processing Skills

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ABSTRACT

Purpose: The present study aimed to comparatively analyze the effectiveness of Socratic dialectic, Cartesian analysis, and Spinozist synthesis in strengthening students' cognitive processing skills within the Philosophy for Students program.

Methods and Materials: This fundamental qualitative study employed a documentary, library-based, and comparative research design. The study corpus consisted of purposively selected primary philosophical works, specialized books, and domestic and international scholarly studies related to Socratic dialectic, Cartesian analysis, Spinozist synthesis, philosophy of education, cognitive science, critical thinking, metacognition, and philosophical inquiry. Data were collected using a researcher-developed document review and conceptual extraction form. Meaningful propositions concerning cognitive mechanisms, educational applications, strengths, limitations, and conditions of effectiveness were identified and coded. The data were analyzed through qualitative content analysis, constant comparison, and comparative interpretation. Initial codes were organized into broader categories, including questioning, conceptual clarification, critical evaluation, analytical decomposition, logical sequencing, inferential reasoning, causal-relational understanding, cognitive synthesis, and metacognitive regulation.

Findings: The comparative analysis indicated that Socratic dialectic was most effective in generating questions, identifying assumptions, clarifying concepts, detecting contradictions, promoting cognitive flexibility, and strengthening metacognitive awareness. Cartesian analysis showed the greatest effectiveness in decomposing complex problems, organizing reasoning sequentially, evaluating evidence, controlling cognitive error, and drawing systematic inferences. Spinozist synthesis was most effective in causal-relational reasoning, systems thinking, knowledge integration, emotional-cognitive coordination, and constructing coherent explanatory structures.

Conclusion: The effectiveness of the three philosophical methods is complementary and context dependent; therefore, their sequential integration can provide a more comprehensive pedagogical framework for strengthening students' critical, analytical, systemic, and metacognitive processing skills.

Keywords: *Socratic dialectic, Cartesian analysis, Spinozist synthesis, Philosophy for Students, cognitive processing skills, critical thinking, philosophical inquiry*

1. Introduction

Contemporary education increasingly emphasizes the development of learners who can question assumptions, analyze complex information, evaluate evidence, construct coherent arguments, revise judgments, and transfer knowledge across unfamiliar situations. These capacities are commonly discussed under concepts such as critical thinking, philosophical thinking, metacognition, cognitive flexibility, problem solving, and cognitive processing. Cognitive processing, in this context, refers not merely to receiving and remembering information but to the interconnected operations through which learners attend to a problem, organize data, distinguish relevant from irrelevant information, interpret concepts, evaluate claims, identify relationships, draw inferences, integrate perspectives, and regulate their own thinking. Educational approaches that rely primarily on direct transmission may support the acquisition of factual knowledge, yet they do not necessarily create sufficient opportunities for students to investigate the foundations of knowledge, articulate reasons, confront contradictions, or reconstruct fragmented information into meaningful wholes. The comparison between cooperative and direct instructional models similarly suggests that educational effectiveness depends on the philosophical assumptions embedded in teaching, including assumptions about the learner, knowledge, interaction, and the process through which understanding is formed (Mehrijou & Babaei Touski, 2025). Consequently, attention has increasingly shifted toward pedagogical models in which students are treated as active participants in inquiry rather than passive recipients of predetermined conclusions.

The Philosophy for Children movement and its related adaptation as Philosophy for Students represent important responses to this educational need. These programs organize learning around philosophical inquiry, collective dialogue, questioning, reason giving, conceptual clarification, and reflective judgment. Philosophy with young learners is not intended to reproduce the academic history of philosophy in a simplified form; rather, it seeks to create a community in which students learn to think philosophically by exploring meaningful questions, listening to competing perspectives, defending interpretations, and reconsidering their assumptions (Kennedy, 2022). Research on inquiry-based teaching has shown that structured opportunities to ask questions and pursue reasons can foster philosophical thinking skills among elementary-school students (Kazemlou et al., 2023). Likewise, studies of Philosophy for

Children curricula have indicated that philosophical inquiry can strengthen critical thinking and problem-solving capacities by engaging learners in reasoning processes that are participatory, reflective, and problem centered (Isiklar & Ozturk, 2022). A recent meta-analytic examination of Philosophy for Children further supports the broader proposition that sustained philosophical engagement can contribute positively to children's cognitive development, although the magnitude and nature of its effects depend on program design, learner characteristics, instructional duration, and the cognitive outcomes assessed (Wei & Chen, 2025). A scoping review of philosophical inquiry similarly concludes that its contribution to critical thinking is most apparent when students are required to justify claims, examine alternatives, and participate in disciplined rather than merely conversational discussion (Looti & Abd-Alzim, 2025).

The educational value of philosophical inquiry is therefore closely related to the particular method through which inquiry is conducted. The term "philosophical method" does not refer to a neutral technique detached from epistemological commitments. Every method contains implicit assumptions concerning what counts as knowledge, how certainty or adequacy can be achieved, how error should be addressed, and what relation exists between the parts of a problem and its overall meaning. Comparative analyses of classical and modern philosophical methods demonstrate that transformations in philosophical method reflect changing conceptions of reason, subjectivity, truth, and the organization of knowledge (Davaranah, 2017). Philosophical analysis itself may involve decomposition, conceptual distinction, logical clarification, interpretation, comparison, and reconstruction, and its precise form varies across intellectual traditions (Rastgoo Tabalvandani et al., 2025). For educational purposes, these differences are highly consequential because different philosophical procedures may activate different dimensions of cognitive processing. A method centered on dialogue may primarily strengthen questioning and argument evaluation, a method centered on decomposition may support logical order and error control, and a method centered on relational synthesis may foster systems thinking and knowledge integration.

Among the classical methods applicable to philosophical education, Socratic dialectic has received the greatest pedagogical attention. Socratic inquiry is founded on the idea that understanding develops through questioning, examination, refutation, and awareness of the insufficiency of one's initial beliefs. Rather than presenting knowledge as

a completed body of answers, the Socratic teacher guides learners toward recognizing inconsistencies, defining concepts more precisely, and providing reasons for their judgments. Historical and logical analyses have distinguished the interrogative and ethical character of Socratic dialectic from later Platonic uses of dialectic, emphasizing that Socrates' method was closely linked to examining interlocutors' beliefs and exposing contradictions within them (Darvishi, 2011). The teaching characteristics associated with Socratic and Platonic dialectic include active dialogue, progressive questioning, conceptual clarification, refutation, and movement from unexamined opinion toward more defensible judgment (Barkhordari et al., 2014). The Socratic method can consequently be understood as a pedagogical structure for transforming the classroom from a site of answer transmission into a setting for disciplined intellectual investigation.

The classroom relevance of Socratic questioning has been emphasized in both theoretical and applied educational research. Practical discussions of Socratic teaching indicate that its successful implementation requires purposeful questions, sufficient time for reflection, tolerance of uncertainty, and a classroom climate in which students can revise their responses without humiliation (Cheraghian, 2025). The method's function in teachers' instruction is particularly evident in its capacity to stimulate participation, reveal learners' misconceptions, and move discussion beyond memorized responses (Eidi et al., 2024). Socratic teaching has also been described as a means of facilitating the teaching of thinking because it makes cognitive processes visible: students are asked not only what they believe, but why they believe it, what evidence supports it, and what follows from it (Hani, 2024). In elementary education, the philosophical foundations of Socratic teaching have been connected to students' understanding of citizenship, suggesting that structured dialogue can support both cognitive judgment and consideration of shared social meanings (Raoudi Naghdeali et al., 2024). Experimental and quasi-experimental investigations have likewise reported that teaching through the Socratic method can contribute to the development of critical thinking among elementary-school students (Sadeghi & Abouei Mehrizi, 2024).

Recent evidence has further clarified the cognitive mechanisms underlying Socratic inquiry. A qualitative study of questioning strategies found that Socratic questioning supports critical thinking when questions progressively require children to explain, compare, infer, evaluate, and reconsider rather than merely recall information (Kanat &

Temel, 2025). Research conducted in mathematics education showed that Socratic questioning can influence students' cognitive structures by helping them connect prior knowledge, recognize algebraic relationships, and reconstruct incomplete or erroneous reasoning (Bimantara et al., 2025). Socratic questioning has also been associated with enhanced cognitive curiosity and historical empathy among university students, indicating that its cognitive contribution may extend beyond formal reasoning to include interest in alternative viewpoints and deeper engagement with human experience (Nemt-allah et al., 2026). Training based on philosophical thinking has similarly been found to improve criticism and critical thinking by requiring learners to formulate questions, evaluate reasons, and respond to competing interpretations (Eghbali, 2021). Beyond education, Socratic questioning has been systematically applied in psychotherapy and counseling as a means of helping individuals identify assumptions, examine cognitive distortions, and generate alternative interpretations (Sahebi, 2020). The presence of Socratic thought in dialectical behavior therapy likewise reflects the broader value of structured questioning for cognitive revision, self-examination, and the integration of apparently conflicting positions (Salimi & Sharif, 2021).

Nevertheless, the Socratic method does not encompass all dimensions of cognitive processing. Its dialogical openness may generate critical awareness without necessarily providing a sufficiently explicit procedure for decomposing complex problems or sequencing analytical steps. This limitation directs attention to Cartesian analysis, which represents a different model of disciplined reasoning. Descartes' method emerged from the modern philosophical concern with certainty, foundations, and the prevention of error. In the *Meditations on First Philosophy*, methodical doubt is used to suspend beliefs that can be questioned and to search for principles that can withstand systematic scrutiny (Descartes, 2025). The Cartesian procedure generally involves refusing premature acceptance, dividing complex difficulties into simpler elements, ordering thought from the most accessible components toward the more complex, and reviewing the process to avoid omission. In educational terms, these principles provide a structured framework for analytical processing, particularly when learners are faced with multidimensional problems that require classification, sequencing, verification, and controlled inference.

The problem of method in Western philosophy and its expression in Descartes and Spinoza shows that

methodological inquiry became central when philosophers sought reliable pathways from uncertainty to knowledge (Sabeti Varzaneh, 2021). Cartesian reasoning privileges clarity, procedural control, and the subject's capacity to reconstruct knowledge from basic elements. Research applying Cartesian doubt to mathematics education has found that an active integrated instructional method based on doubt can improve students' critical thinking by requiring them to question given assumptions and test the validity of procedures (Ghani et al., 2015). A related study reported that Cartesian doubt-based instruction could contribute to both creative and critical thinking, particularly when students were encouraged to explore alternative solutions while systematically examining the correctness of each step (Ghani & Eslami Moghadam, 2016). These findings suggest that Cartesian analysis should not be reduced to rigid skepticism; educationally applied, it can encourage disciplined uncertainty, resistance to cognitive haste, and the stepwise organization of reasoning.

At the same time, Cartesian analysis has been criticized for tendencies toward abstraction, reductionism, and the separation of knowledge from historical, cultural, and relational contexts. Vico's criticisms of Cartesian thought, for example, identify the limits of treating all domains of understanding according to the model of clear, distinct, and deductively ordered knowledge, thereby contributing to the emergence of historical thinking (Darbanian & Abdolkarimi, 2022). These criticisms are relevant to education because students' problems are not always reducible to isolated components with singular solutions. Moral, social, emotional, and interdisciplinary questions often involve networks of causation, changing contexts, and multiple levels of meaning. A strictly Cartesian model may therefore strengthen analytical precision while leaving learners with fragmented knowledge unless the analyzed parts are subsequently reconstructed into a coherent whole.

Spinozist synthesis offers a philosophical resource for this reconstructive task. Spinoza's philosophy is organized around the intelligibility of reality through relations, causes, necessity, and the systematic connection of ideas. Human understanding becomes more adequate when isolated or partial perceptions are replaced by ideas that express how things are causally and conceptually related. Spinoza's philosophical anthropology emphasizes that human cognition, emotion, embodiment, and action are not disconnected domains but elements within a unified natural order (Sabeti Varzaneh et al., 2020). His ethical thought similarly treats freedom not as independence from causation

but as the growth of understanding through recognition of the causes that shape affects and judgments. Moral education from a Spinozist perspective consequently involves helping learners move from passive and confused responses toward more adequate understanding, rational self-direction, and awareness of the relational conditions of action (Dehghan-Khalili, 2018).

Spinozist synthesis can therefore be interpreted educationally as a movement from fragmented ideas toward integrated cognitive structures. Whereas Cartesian analysis divides a problem to make it manageable, Spinozist synthesis asks how the analyzed elements belong to a larger causal and conceptual system. It supports the identification of patterns, interdependencies, underlying causes, and relations between cognitive and emotional experience. Accurate interpretation of Spinoza is important in this regard because terminological and translational choices can alter the meaning of key concepts such as substance, attribute, mode, adequate idea, and affect. Critical assessment of Persian translations of Spinoza's *Ethics* has highlighted the importance of conceptual precision when transferring his philosophical system into another language and intellectual context (Nikzad, 2025). Such precision is equally necessary when adapting Spinozist concepts for educational use; synthesis should not mean the uncritical combination of ideas, but rather their integration according to defensible causal and conceptual relations.

The comparison between Cartesian analysis and Spinozist synthesis also reveals both continuity and difference. Spinoza shares the modern philosophical concern with method, rational explanation, and systematic knowledge, yet he rejects forms of dualism and reconstructs understanding through a more thoroughly relational ontology. The methodological trajectory from Descartes to Spinoza can thus be read as a movement from the search for indubitable foundations and analytic order toward the construction of an integrated system in which parts are understood through their place within the whole (Sabeti Varzaneh, 2021). From the perspective of cognitive education, this movement corresponds to the transition from decomposition and verification to causal integration and systemic comprehension. The educational significance of this transition is substantial because effective cognitive processing requires both differentiation and integration. Students must be able to separate claims, evidence, concepts, and assumptions, but they must also reconstruct these elements into coherent explanatory models.

The importance of combining critical, analytical, and synthetic processes is reinforced by broader research on thinking skills. Instructional guides for thinking skills emphasize that effective reasoning includes questioning, information processing, evaluation, inference, problem solving, creativity, and reflection rather than a single isolated operation (Jeffries & Hancock, 2011). Programs designed to promote philosophizing among preschool children have also shown positive effects on cognitive flexibility and proactive inhibition, indicating that philosophical activities can contribute to executive control and the capacity to shift between perspectives (Hamidi & Otoufati Roudi, 2021). Comparative research on Western and non-Western philosophy students suggests that philosophical traditions and educational practices may cultivate different forms of critical thinking, further supporting the need to avoid equating philosophical cognition with one uniform method (Chagalakonda, 2024). Epistemological comparisons between Qur'anic and Western philosophical traditions likewise show that different systems of thought organize the sources, limits, and validation of knowledge in distinct ways (Sharifi et al., 2023). These studies collectively indicate that the educational study of philosophical method should attend to the particular cognitive architecture promoted by each approach.

Within the Philosophy for Students program, the three methods examined in the present study may consequently be conceptualized as distinct stages or functions within a broader cognitive cycle. Socratic dialectic initiates inquiry by transforming accepted claims into questions, exposing assumptions, and creating the need for justification. Cartesian analysis organizes inquiry by dividing complex problems, arranging elements, examining evidence, and verifying inferential steps. Spinozist synthesis completes and expands inquiry by reconnecting the analyzed elements, identifying causal and relational structures, and integrating cognitive and affective understanding. The redefinition of dialectical teaching through Socratic and later dialectical logics shows that classroom dialogue requires both movement through contradiction and an organized process of conceptual development (Eslami & Kheiri, 2022). Philosophical pedagogy is therefore likely to be most effective when dialogue does not remain an unstructured exchange, analysis does not result in fragmentation, and synthesis does not occur without prior criticism.

A comparative framework is particularly necessary because previous research has generally examined one philosophical method or one educational outcome at a time.

Studies of Socratic teaching have concentrated on critical thinking, questioning, participation, citizenship, or conceptual understanding (Cheraghian, 2025; Kanat & Temel, 2025; Sadeghi & Abouei Mehrizi, 2024). Research on Cartesian doubt has mainly addressed analytical and critical thinking in mathematics education (Ghanei et al., 2015; Ghanei & Eslami Moghadam, 2016). Studies related to Spinoza have more often remained within philosophical anthropology, ethics, translation, or the history of method rather than directly examining classroom cognitive processing (Dehghan-Khalili, 2018; Nikzad, 2025; Saberi Varzaneh et al., 2020). Furthermore, although active and cooperative pedagogies have been contrasted with direct teaching, the internal philosophical mechanisms through which different inquiry models influence cognition remain insufficiently differentiated (Mehrpour & Babaei Touski, 2025). This fragmentation creates a conceptual gap concerning whether Socratic, Cartesian, and Spinozist methods should be regarded as competing approaches, context-dependent alternatives, or complementary components of an integrated philosophical pedagogy.

Addressing this gap has both theoretical and practical significance. Theoretically, comparison can clarify which cognitive operations are most strongly associated with each philosophical method and prevent the broad concept of "philosophical thinking" from becoming analytically vague. Practically, it can guide teachers in selecting methods according to the nature of the learning task. A classroom problem requiring exposure of hidden assumptions may be especially suited to Socratic dialogue; a complex task requiring ordered decomposition may benefit from Cartesian analysis; and an interdisciplinary or causal problem may require Spinozist synthesis. The effectiveness of Philosophy for Students is therefore likely to depend not only on whether philosophical inquiry occurs, but also on how its phases are structured and which philosophical method is used to support each dimension of cognition. The accumulating evidence concerning philosophical inquiry, cognitive development, critical thinking, cognitive flexibility, curiosity, and problem solving makes such differentiation increasingly necessary (Looti & Abd-Alzim, 2025; Nemtallah et al., 2026; Wei & Chen, 2025).

Accordingly, the aim of the present study was to comparatively analyze the effectiveness of Socratic dialectic, Cartesian analysis, and Spinozist synthesis in the Philosophy for Students program with regard to their capacities for strengthening students' cognitive-processing skills.

2. Methods and Materials

The present study was conducted as a fundamental qualitative inquiry aimed at comparatively examining the effectiveness of three philosophical methods—Socratic dialectic, Cartesian analysis, and Spinozist synthesis—in strengthening students' cognitive processing skills within the framework of the Philosophy for Students program. Given that the principal objective was to clarify the theoretical foundations, cognitive mechanisms, educational capacities, and potential limitations of these philosophical approaches rather than to measure their effects through an experimental intervention, a qualitative, documentary, and comparative research design was adopted. The study was grounded in the assumption that each philosophical method represents a distinct pattern of thinking and cognitive organization. Socratic dialectic is primarily based on questioning, dialogical inquiry, conceptual clarification, and the critical examination of assumptions; Cartesian analysis emphasizes systematic doubt, decomposition of complex problems, sequential reasoning, and the pursuit of clear and distinct ideas; and Spinozist synthesis focuses on the recognition of relations, causal necessity, integration of fragmented knowledge, and the construction of a coherent understanding of phenomena. These three approaches were therefore examined as potentially complementary yet analytically distinguishable models for developing cognitive processing abilities among students.

The study sample did not consist of human participants but comprised a purposively selected corpus of philosophical, educational, and cognitive-science documents relevant to the research problem. The documentary corpus included primary philosophical works associated with Socrates and the Socratic tradition, the writings of René Descartes, and the works of Baruch Spinoza, together with specialized books and scholarly studies addressing philosophy of education, Philosophy for Children and Philosophy for Students, critical thinking, metacognition, reasoning, cognitive processing, dialogical education, and philosophical inquiry in educational settings. Both domestic and international sources were considered to ensure that the analysis reflected philosophical interpretations as well as contemporary educational and cognitive perspectives. Sources were selected purposefully according to their conceptual relevance, scholarly credibility, direct engagement with at least one of the three philosophical methods, and explanatory value concerning the development of students' cognitive skills. Documents

that addressed the philosophers only historically, without offering sufficient conceptual or educational content, and sources that lacked a clear relationship with cognitive processing or philosophical education were excluded from the final corpus.

The unit of analysis consisted of meaningful propositions, conceptual statements, theoretical arguments, and educational interpretations related to the cognitive functions of the three philosophical methods. Particular attention was paid to statements explaining how each method may influence such processes as attention, questioning, conceptual differentiation, information decomposition, logical sequencing, inference, causal reasoning, critical evaluation, synthesis, cognitive flexibility, metacognitive monitoring, and the integration of ideas. Sampling continued through theoretical and conceptual saturation, meaning that documentary review was maintained until the examination of additional sources no longer yielded substantially new cognitive components or comparative dimensions. This procedure allowed the study to develop a sufficiently comprehensive conceptual representation of the three methods while maintaining consistency with the qualitative and interpretive nature of the research.

Data were collected through a library-based and documentary procedure using a researcher-developed document review and conceptual extraction framework. The principal data collection instrument was a structured documentary analysis form designed to organize the extraction of philosophical foundations, cognitive components, educational mechanisms, strengths, limitations, and conditions of applicability associated with Socratic dialectic, Cartesian analysis, and Spinozist synthesis. The form provided a consistent framework for recording bibliographic information, the philosophical context of each source, its central propositions, its relevance to cognitive processing, its possible application in the Philosophy for Students program, and the specific cognitive skills that could be supported through the method under investigation. The use of a structured extraction framework reduced the possibility of unsystematic interpretation and enabled comparable information to be collected from sources that differed in philosophical orientation, historical period, disciplinary focus, and methodological approach.

The data collection process was conducted in several interconnected stages. Initially, the conceptual foundations of each philosophical method were extracted from primary and authoritative philosophical sources. For the Socratic method, attention was directed toward dialogical

questioning, elenchus, the examination of beliefs, the recognition of contradiction, intellectual humility, and the collaborative search for more defensible judgments. In the case of Cartesian analysis, the review focused on methodical doubt, the division of complex questions into simpler elements, progression from simple to complex ideas, systematic enumeration, and the verification of reasoning. For Spinozist synthesis, the extraction process emphasized causal understanding, relational thinking, the integration of ideas, the distinction between adequate and inadequate knowledge, the formation of coherent explanatory systems, and the movement from partial perceptions toward comprehensive understanding. These philosophical components were subsequently interpreted in relation to contemporary theories of cognition and education.

In the next stage, scholarly sources concerning philosophical education, cognitive development, critical thinking, and the Philosophy for Students program were reviewed to identify the educational mechanisms through which the three methods could be operationalized in classroom contexts. The analysis considered practices such as teacher-guided questioning, classroom dialogue, problem decomposition, hypothesis examination, conceptual mapping, causal explanation, reflective discussion, argument reconstruction, and the synthesis of multiple viewpoints. Each extracted component was recorded according to its probable contribution to one or more dimensions of cognitive processing. These dimensions included the reception and organization of information, selective attention, conceptual analysis, logical processing, evaluation of evidence, identification of assumptions, production of inferences, problem solving, integration of information, transfer of learning, cognitive flexibility, and metacognitive regulation.

To improve the credibility and dependability of the documentary data, sources were cross-checked across different categories of literature. Interpretations derived from primary philosophical works were compared with those presented in contemporary philosophical commentaries, educational studies, and cognitive-science literature. Conceptual consistency was also assessed by repeatedly reviewing extracted statements and comparing them with the broader argument of the source from which they were obtained. Where multiple interpretations of a philosophical concept existed, the interpretations most directly relevant to education and cognitive skill development were retained, while differences among interpretations were documented during analysis rather than

artificially eliminated. This procedure supported a balanced reconstruction of each method and minimized the risk of reducing complex philosophical systems to isolated instructional techniques.

The collected data were analyzed through qualitative content analysis combined with comparative analysis. Qualitative content analysis was used to identify, classify, interpret, and organize the cognitive and educational components embedded in the selected philosophical and scholarly documents. The analysis began with repeated and close reading of the documentary corpus to achieve familiarity with the conceptual structure of the sources. During this stage, meaningful units related to reasoning, questioning, analysis, synthesis, judgment, conceptualization, causal understanding, reflection, and cognitive regulation were identified. These units were then assigned initial codes that represented the cognitive processes or educational mechanisms expressed in the text. Examples of such codes included challenging unexamined assumptions, detecting contradictions, decomposing complex problems, arranging ideas sequentially, distinguishing clear from ambiguous concepts, identifying causal relations, integrating perspectives, reconstructing arguments, monitoring thought processes, and forming coherent judgments.

Following initial coding, conceptually similar codes were grouped into broader categories corresponding to major dimensions of cognitive processing. These categories included critical-dialogical processing, analytical processing, inferential processing, integrative processing, causal processing, problem-solving processes, metacognitive monitoring, cognitive flexibility, and knowledge organization. The categories were continuously reviewed and refined through constant comparison across documents. This process made it possible to determine whether a particular cognitive component was specific to one philosophical method, shared by two methods, or present in all three but expressed through different philosophical mechanisms. For example, all three methods could contribute to rational thinking, but Socratic dialectic was interpreted as promoting rationality primarily through dialogical examination and refutation, Cartesian analysis through systematic decomposition and procedural order, and Spinozist synthesis through relational integration and causal coherence.

After the categories had been established, a comparative analytical framework was applied to evaluate the relative effectiveness of the three methods within the Philosophy for

Students program. Comparison was conducted according to several interpretive criteria, including the type of cognitive activity encouraged by each method, the level of student participation required, the degree of structure provided to the thinking process, the capacity to develop critical and reflective judgment, the ability to manage complex information, the contribution to the integration of knowledge, the suitability for collaborative classroom inquiry, and the potential limitations of classroom application. The purpose of this comparison was not to produce a numerical ranking but to identify the distinctive educational contribution, strengths, weaknesses, and conditions of effectiveness associated with each method.

The Socratic method was examined particularly in relation to dialogical reasoning, the active interrogation of beliefs, critical reflection, responsiveness to alternative perspectives, and the development of reasoned judgment. Cartesian analysis was evaluated in terms of methodological precision, sequential thinking, problem decomposition, error reduction, clarity of concepts, and systematic problem solving. Spinozist synthesis was assessed according to its ability to promote relational thinking, causal comprehension, intellectual integration, holistic understanding, and the construction of coherent networks of knowledge. The analysis also considered possible limitations. Socratic dialogue may remain inconclusive or depend heavily on the competence of the facilitator; Cartesian analysis may fragment multidimensional educational problems or overemphasize linear reasoning; and Spinozist synthesis may require a level of abstraction and conceptual maturity that can be difficult for younger students without appropriate scaffolding.

To arrive at the final interpretation, the categories and comparative findings were synthesized into an explanatory model showing how the three methods could function separately and in combination. The analysis treated Socratic dialectic as a mechanism for initiating inquiry and questioning assumptions, Cartesian analysis as a means of organizing and examining the components of a problem, and Spinozist synthesis as a method for reconnecting those components within a coherent relational and causal structure. From this perspective, comparative effectiveness was assessed not only in terms of which method was stronger in a particular cognitive domain, but also in terms of how the three approaches could form a sequential and complementary pedagogical process. The credibility of the final interpretations was strengthened through continuous return to the original documents, comparison of competing

interpretations, maintenance of a clear conceptual link between codes and philosophical propositions, and avoidance of claims that could not be supported by the reviewed sources.

3. Findings and Results

Because the present study was based on documentary and library research rather than participation by human respondents, demographic characteristics such as age, gender, educational level, and socioeconomic status were not applicable. Accordingly, the descriptive profile of the study concerned the characteristics of the analyzed documents. The final documentary corpus consisted of 72 sources selected through purposive and conceptually driven sampling. Of these sources, 18 documents, representing 25.0% of the corpus, addressed the philosophical foundations and educational implications of Socratic dialectic; 15 documents, representing 20.8%, examined Cartesian analysis and methodological reasoning; and 14 documents, representing 19.4%, focused on Spinozist epistemology, causal reasoning, and synthetic understanding. The remaining 25 sources, representing 34.7% of the corpus, were interdisciplinary studies concerning Philosophy for Children or Philosophy for Students, philosophy of education, critical thinking, cognitive processing, metacognition, dialogical learning, reasoning, and problem-solving skills. In terms of source type, 21 sources were primary or classical philosophical texts, 17 were specialized books or book chapters, and 34 were peer-reviewed scholarly articles. Thirty-eight sources were published in English, 22 in Persian, and 12 were translated editions of classical philosophical works. The selected corpus covered both foundational philosophical materials and contemporary educational and cognitive interpretations, thereby enabling the comparison to move beyond purely historical description and toward an assessment of the practical educational effectiveness of the three methods. Repeated analysis of the documents resulted in the identification of 386 initial meaning units, which were condensed into 64 primary codes, 18 subcategories, and nine overarching cognitive-processing categories. The nine final categories were questioning and problem identification, conceptual clarification, critical evaluation, analytical decomposition, logical sequencing, inferential reasoning, causal-relational understanding, cognitive synthesis, and metacognitive regulation. Conceptual saturation was reached when the examination of additional sources no

longer produced a substantively new cognitive component or a new comparative criterion.

Table 1

Cognitive Components, Educational Mechanisms, and Expected Outcomes of Socratic Dialectic, Cartesian Analysis, and Spinozist Synthesis

Philosophical method	Core philosophical principle	Principal educational mechanism	Main cognitive-processing components	Expected cognitive outcome	Dominant level of cognitive activity
Socratic dialectic	Knowledge develops through questioning, examination, and recognition of contradiction	Guided dialogue, open-ended questioning, conceptual challenge, and collaborative inquiry	Question formulation, assumption identification, contradiction detection, conceptual clarification, argument evaluation, perspective taking, reflective judgment, and intellectual self-correction	Development of critical, dialogical, reflective, and evaluative thinking	Interactive, critical, and metacognitive
Socratic dialectic	Awareness of ignorance is a prerequisite for inquiry	Encouraging students to explain, justify, reconsider, and revise their responses	Intellectual humility, uncertainty tolerance, monitoring of beliefs, revision of judgments, and awareness of cognitive limitations	Greater openness to correction and reduced acceptance of unsupported claims	Metacognitive and reflective
Socratic dialectic	Meaning is clarified through dialogue and examination of definitions	Analysis of examples, counterexamples, and competing definitions	Categorization, differentiation, comparison, identification of necessary and sufficient features, and semantic precision	More accurate concept formation and improved verbal reasoning	Conceptual and linguistic
Cartesian analysis	Complex problems should be divided into simpler and more manageable components	Systematic problem decomposition and staged examination	Segmentation, classification, prioritization, sequential processing, identification of basic elements, and reduction of cognitive complexity	Improved analytical clarity and systematic problem solving	Analytical and procedural
Cartesian analysis	Doubt should be used methodically to prevent error	Verification of claims, evidence checking, and suspension of premature judgment	Source evaluation, error detection, evidence discrimination, hypothesis testing, and control of cognitive bias	Increased accuracy, caution, and epistemic discipline	Critical and analytical
Cartesian analysis	Reasoning should progress from simple and evident elements to more complex conclusions	Step-by-step reconstruction of arguments and solutions	Logical sequencing, deductive reasoning, rule application, hierarchical organization, and verification of intermediate conclusions	More coherent reasoning and reduced omission of relevant problem elements	Sequential and logical
Spinozist synthesis	Adequate understanding requires recognition of causal and necessary relations	Construction of causal explanations and relational networks	Causal inference, relational reasoning, system mapping, contextual interpretation, and recognition of interdependence	Deeper understanding of how ideas and phenomena are connected	Relational and explanatory
Spinozist synthesis	Fragmented ideas become more adequate when integrated into a coherent whole	Conceptual synthesis, integration of multiple viewpoints, and reconstruction of wholes from parts	Integration, generalization, pattern recognition, knowledge organization, reconciliation of apparently conflicting ideas, and systems thinking	Holistic understanding and coherent knowledge structures	Synthetic and systemic
Spinozist synthesis	Emotions and judgments become intelligible through awareness of their causes	Reflective analysis of affective and cognitive determinants	Emotional-cognitive integration, causal self-understanding, perspective transformation, and regulation through comprehension	Improved self-regulation and more reasoned interpretation of emotional responses	Integrative and self-reflective
Combined application	Inquiry is strengthened when questioning, analysis, and synthesis are connected	Sequential use of Socratic questioning, Cartesian decomposition, and Spinozist reconstruction	Problem identification, critical examination, decomposition, evidence evaluation, causal analysis, integration, and reflective judgment	Comprehensive cognitive processing that is simultaneously critical, systematic, and holistic	Multilevel and integrated

As shown in Table 1, each philosophical method contributed to cognitive processing through a distinctive but related mechanism. Socratic dialectic was most strongly associated with the initiation and critical regulation of thought. Its primary contribution lay in transforming passive reception of information into active inquiry by requiring

students to formulate questions, justify claims, identify contradictions, and revise insufficiently supported beliefs. The findings indicated that Socratic dialogue did not merely increase verbal participation; rather, it activated higher-order processes involving conceptual differentiation, evaluation of reasons, recognition of uncertainty, and metacognitive

awareness. Cartesian analysis, in contrast, was primarily associated with the structural organization of cognition. Its distinctive contribution consisted of reducing complex problems into smaller units, arranging these units in a logical sequence, examining each step, and preventing cognitive error through systematic verification. The Cartesian approach therefore appeared particularly effective in tasks requiring procedural clarity, deductive organization, and controlled problem solving. Spinozist synthesis demonstrated its greatest effectiveness in the reconstruction and integration of knowledge. It supported students in moving beyond isolated facts and fragmented conclusions

toward the recognition of causal relations, interdependencies, patterns, and larger conceptual systems. The comparative findings therefore showed that Socratic dialectic was strongest in generating and regulating inquiry, Cartesian analysis was strongest in organizing and testing the elements of inquiry, and Spinozist synthesis was strongest in integrating the results of inquiry into a coherent explanatory structure. The combined use of the three methods provided the broadest coverage of cognitive processing because it connected questioning, analysis, and synthesis within a single educational sequence.

Table 2

Frequency and Relative Emphasis of Cognitive-Processing Codes Identified in the Documentary Analysis

Cognitive-processing category	Socratic dialectic, n	Cartesian analysis, n	Spinozist synthesis, n	Total coded units, n	Dominant method	Comparative interpretation
Questioning and problem identification	35	12	8	55	Socratic dialectic	Socratic inquiry most strongly initiated cognitive engagement by transforming statements into examinable problems
Conceptual clarification	30	18	14	62	Socratic dialectic	Socratic dialogue emphasized definitions and distinctions, while Cartesian analysis added precision and Spinozist synthesis added relational meaning
Critical evaluation of assumptions and evidence	32	27	11	70	Socratic dialectic	Socratic and Cartesian methods both promoted critical evaluation, but through dialogue and methodological doubt, respectively
Analytical decomposition	11	38	9	58	Cartesian analysis	Cartesian reasoning had a clear advantage in dividing complex problems into simpler components
Logical sequencing and procedural organization	13	34	15	62	Cartesian analysis	Cartesian analysis most consistently supported ordered reasoning and verification of successive cognitive steps
Inferential reasoning	21	26	19	66	Cartesian analysis	All methods supported inference, although Cartesian analysis provided the most explicit procedural structure
Causal-relational understanding	8	16	39	63	Spinozist synthesis	Spinozist synthesis was dominant in explaining necessity, interdependence, and causal relations
Cognitive synthesis and integration	9	14	41	64	Spinozist synthesis	Spinozist thought was most strongly associated with reconstructing fragmented knowledge into coherent wholes
Metacognitive regulation and self-correction	28	19	21	68	Socratic dialectic	Socratic self-examination was dominant, although Cartesian verification and Spinozist self-understanding also contributed
Total	187	204	177	568	—	The largest number of codes was associated with Cartesian analysis, but each method showed a different pattern of cognitive specialization

Table 2 presents the distribution of the 568 coded references assigned to the nine final cognitive-processing categories. The number of coded references exceeded the 386 initial meaning units because a single meaning unit could be assigned to more than one cognitive category when it represented several interrelated processes. Cartesian analysis produced the greatest total number of coded references, with 204 instances, followed by Socratic

dialectic with 187 and Spinozist synthesis with 177. This numerical pattern, however, did not indicate the absolute superiority of Cartesian analysis. Rather, it reflected the high frequency with which Cartesian principles were connected to several procedural processes, particularly analytical decomposition, logical sequencing, evidence evaluation, and inferential reasoning. Socratic dialectic showed the highest frequencies in questioning and problem identification,

conceptual clarification, critical evaluation, and metacognitive regulation. The strongest Socratic category was questioning and problem identification, with 35 coded references, demonstrating that the Socratic method was especially effective at activating inquiry and disrupting unexamined acceptance. Cartesian analysis was dominant in analytical decomposition, with 38 coded references, and logical sequencing, with 34 references. These results indicated that the Cartesian method offered the most explicit structure for controlling the order and accuracy of reasoning. Spinozist synthesis was markedly dominant in cognitive synthesis and integration, with 41 references, and causal-

relational understanding, with 39 references. This pattern demonstrated that Spinozist reasoning was less focused on initiating questions or dividing problems and more focused on explaining how elements belong to a larger system. The distribution of codes therefore confirmed a pattern of differentiated effectiveness: Socratic dialectic predominantly strengthened inquiry-oriented and metacognitive processes, Cartesian analysis predominantly strengthened procedural and analytical processes, and Spinozist synthesis predominantly strengthened integrative and systemic processes.

Table 3

Comparative Evaluation of the Educational Strengths, Limitations, and Conditions of Effectiveness of the Three Methods

Method	Principal strengths	Principal limitations	Most suitable learning activities	Required teacher role	Conditions that increase effectiveness	Risks of inappropriate implementation
Socratic dialectic	Activates student participation; develops questioning; reveals contradictions; strengthens argumentation; promotes intellectual humility; encourages revision of beliefs; supports collaborative reasoning	May produce discussion without closure; can privilege verbally confident students; may cause confusion when questions lack direction; depends strongly on facilitation quality; may remain at the level of debate rather than knowledge construction	Ethical dilemmas, conceptual discussions, examination of assumptions, interpretation of ambiguous situations, argument evaluation, and reflective classroom dialogue	Dialogue facilitator who asks progressively focused questions, ensures balanced participation, requests justification, summarizes emerging ideas, and prevents personal confrontation	Psychologically safe classroom, clear discussion rules, developmentally appropriate questions, adequate waiting time, equal participation, and connection between dialogue and learning objectives	Superficial questioning, teacher domination, humiliation through refutation, endless relativism, competitive debate, and failure to consolidate conclusions
Cartesian analysis	Provides procedural clarity; reduces complexity; strengthens logical order; improves accuracy; promotes verification; supports independent problem solving; facilitates identification of error	May fragment holistic issues; may overemphasize linear reasoning; can neglect context and emotion; may reduce creativity when applied rigidly; assumes that problems can be divided into stable components	Complex problem solving, argument reconstruction, classification, planning, stepwise reasoning, evidence evaluation, and analysis of scientific or logical problems	Cognitive organizer who models decomposition, guides sequencing, prompts verification, and gradually transfers responsibility to students	Explicit modeling, use of manageable problems, visual organization of steps, opportunities for independent application, and final reconstruction of the whole problem	Mechanical reasoning, excessive reductionism, loss of contextual meaning, rigid adherence to steps, and treatment of uncertain problems as if they have one fixed solution
Spinozist synthesis	Develops systemic and relational thinking; strengthens causal explanation; integrates multiple perspectives; supports coherent knowledge organization; connects cognition and emotion; promotes holistic interpretation	Requires abstraction; may be difficult for younger students; complex causal networks may create cognitive overload; synthesis may occur before adequate analysis; students may confuse association with causation	Concept mapping, causal-network construction, interdisciplinary inquiry, synthesis of viewpoints, explanation of social or natural systems, and reflective integration of emotion and reasoning	Conceptual mediator who makes relations visible, scaffolds causal reasoning, connects separate findings, and helps students distinguish superficial connections from necessary relations	Prior analytical preparation, use of concrete examples, visual models, gradual movement from simple to complex relations, and explicit attention to causal validity	Premature generalization, vague holism, unsupported causal claims, excessive abstraction, and integration of incompatible ideas without critical evaluation
Integrated model	Covers the full cognitive cycle from questioning to decomposition,	Requires more instructional time; demands high teacher competence;	Philosophical inquiry projects, complex social and ethical problems,	Designer and facilitator of a staged inquiry process who moves	Flexible sequencing, age-appropriate scaffolding, explicit transitions between	Treating the model as a rigid formula, insufficient time for any stage, lack

examination, causal explanation, and synthesis; balances criticality, structure, and holism; supports transfer and metacognition	stages may overlap; excessive complexity may burden students; implementation must be adapted to age and content	interdisciplinary projects, collaborative problem solving, and reflective evaluation	students from questioning to analysis and then to synthesis	stages, combination of individual and collaborative work, and formative assessment	of alignment with learning outcomes, and overloading students with multiple cognitive demands
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The findings presented in Table 3 demonstrate that the effectiveness of each philosophical method depended not only on its theoretical properties but also on the conditions under which it was implemented. Socratic dialectic had a strong capacity to create an active community of inquiry, yet its effectiveness was highly dependent on the teacher's ability to formulate questions that progressively deepen reasoning. When the teacher merely asked numerous questions without conceptual direction, dialogue could become repetitive, unfocused, or dominated by students with stronger verbal abilities. Cartesian analysis provided the greatest procedural clarity and was particularly suitable for complex tasks that could be broken into identifiable components. Nevertheless, rigid application of Cartesian decomposition created the risk of reductionism, especially in moral, social, emotional, or interdisciplinary problems whose meaning depends on context and interaction. Spinozist synthesis offered the strongest framework for

systemic and relational understanding, but it required sufficient prior analysis. When synthesis occurred before students had carefully examined the component ideas, the resulting conclusions tended to be vague, overly generalized, or causally unsupported. The integrated model reduced the limitations of each isolated method. Socratic questioning prevented Cartesian analysis from becoming mechanically procedural by ensuring that the problem and its assumptions remained open to examination. Cartesian analysis prevented Socratic dialogue from remaining inconclusive by organizing the emerging questions into a manageable sequence. Spinozist synthesis prevented analytical decomposition from producing fragmented knowledge by reconnecting the analyzed elements within a causal and conceptual whole. The findings therefore indicated that no method could be considered universally effective independently of instructional context, student readiness, teacher competence, and the nature of the cognitive task.

Table 4

Qualitative Rating of the Comparative Effectiveness of the Three Methods in Strengthening Cognitive-Processing Skills

Cognitive-processing skill	Socratic dialectic	Cartesian analysis	Spinozist synthesis	Most effective approach	Rationale for comparative judgment
Generating questions	Very high	Moderate	Low to moderate	Socratic dialectic	Socratic inquiry begins with uncertainty, contradiction, and the transformation of accepted statements into questions
Identifying assumptions	Very high	High	Moderate	Socratic dialectic	Socratic refutation directly exposes hidden beliefs and requires students to defend their presuppositions
Conceptual clarification	Very high	High	High	Socratic dialectic	Dialogue, examples, counterexamples, and definition testing provide a particularly strong mechanism for refining concepts
Evaluating evidence	High	Very high	Moderate	Cartesian analysis	Methodical doubt and verification require students to assess the reliability and sufficiency of evidence
Decomposing complex problems	Moderate	Very high	Moderate	Cartesian analysis	Division of complexity into simpler elements is the central procedural feature of Cartesian method
Organizing reasoning sequentially	Moderate to high	Very high	High	Cartesian analysis	Progression from simple to complex ideas provides a clear structure for ordered reasoning
Detecting contradictions	Very high	High	Moderate	Socratic dialectic	Contradiction detection is central to Socratic examination and belief revision
Drawing logical inferences	High	Very high	High	Cartesian analysis	Cartesian method provides explicit procedures for linking premises, intermediate steps, and conclusions
Understanding causal relationships	Moderate	High	Very high	Spinozist synthesis	Spinozist reasoning emphasizes necessity, interdependence, and explanation through causal relations
Integrating multiple viewpoints	High	Moderate	Very high	Spinozist synthesis	Synthesis reconstructs different perspectives within a broader coherent system
Systems thinking	Moderate	Moderate	Very high	Spinozist synthesis	Spinozist thought interprets phenomena through networks of relations rather than isolated elements

Cognitive flexibility	Very high	Moderate	High	Socratic dialectic	Exposure to counterarguments and alternative interpretations encourages revision of initial judgments
Metacognitive awareness	Very high	High	High	Socratic dialectic	Recognition of uncertainty and examination of one's own reasoning strengthen awareness of cognitive limitations
Cognitive accuracy and error control	High	Very high	High	Cartesian analysis	Verification, enumeration, and stepwise examination reduce omission and premature judgment
Knowledge coherence	High	High	Very high	Spinozist synthesis	Spinozist synthesis organizes fragmented information into integrated explanatory structures
Emotional-cognitive integration	Moderate	Low to moderate	Very high	Spinozist synthesis	Understanding emotions through their causes links affective experience with rational comprehension
Transfer of learning	High	High	Very high	Integrated use, with strong Spinozist contribution	Transfer requires recognition of underlying relations, but also questioning and analytical restructuring
Overall cognitive-processing effectiveness	High	High	High	Integrated model	The methods are complementary and jointly cover initiation, organization, evaluation, and integration of cognition

Table 4 provides a qualitative comparison of the effectiveness of the three philosophical methods across 18 cognitive-processing skills. The ratings were derived from the density of related codes, the consistency of the identified mechanism across sources, and the directness of the relationship between the philosophical principle and the cognitive skill. Socratic dialectic received very high ratings in generating questions, identifying assumptions, conceptual clarification, detecting contradictions, cognitive flexibility, and metacognitive awareness. This profile showed that its strongest contribution concerned the critical activation and self-regulation of thinking. Cartesian analysis received very high ratings in evaluating evidence, decomposing complex problems, organizing reasoning sequentially, drawing logical inferences, and controlling cognitive error. Its profile therefore reflected accuracy, procedural discipline, and analytical organization. Spinozist synthesis received very high ratings in causal understanding, integration of multiple viewpoints, systems thinking, knowledge coherence, and emotional-cognitive integration. Its profile indicated strength in reconstructing knowledge, understanding interdependence, and connecting separate cognitive and affective elements. All three methods were judged highly effective overall, but none received the highest rating across every domain. The integrated method was therefore considered the most comprehensive approach because it combined the strongest functions of the three models. In practical terms, students could first use Socratic dialogue to recognize a problem and examine its assumptions, then employ Cartesian analysis to divide and systematically investigate the problem, and finally apply Spinozist synthesis to identify relations and construct a coherent understanding. This sequence provided more complete

support for cognitive processing than the isolated and uniform application of any single method.

4. Discussion and Conclusion

The findings of the present study showed that Socratic dialectic, Cartesian analysis, and Spinozist synthesis each contribute to the strengthening of students' cognitive-processing skills through a distinct but complementary mechanism. Socratic dialectic demonstrated its greatest effectiveness in initiating inquiry, identifying assumptions, clarifying concepts, detecting contradictions, promoting cognitive flexibility, and strengthening metacognitive awareness. Cartesian analysis was most effective in decomposing complex problems, organizing reasoning sequentially, evaluating evidence, drawing controlled inferences, and reducing cognitive error. Spinozist synthesis showed its strongest contribution in causal-relational understanding, systems thinking, knowledge integration, emotional-cognitive coordination, and the construction of coherent explanatory structures. The overall pattern therefore indicated that none of the three methods was sufficient by itself to cover the full range of cognitive-processing operations required in the Philosophy for Students program. Rather, their combined application offered the most comprehensive model because it connected questioning, analytical organization, and synthetic reconstruction within a cyclical process of inquiry.

The strong performance of Socratic dialectic in questioning and problem identification is consistent with the fundamental character of the Socratic method as an interrogative and dialogical form of inquiry. Socratic dialogue begins by disturbing the apparent certainty of everyday beliefs and transforming taken-for-granted

statements into examinable claims. This process compels learners to articulate the foundations of their judgments and recognize gaps, contradictions, or unsupported assumptions in their reasoning. The distinction between the dialectical procedures of Socrates and Plato similarly emphasizes the central role of questioning, refutation, and the examination of beliefs in Socratic practice (Darvishi, 2011). The characteristics of dialectic as a teaching method also include progressive questioning, conceptual clarification, and movement from unexamined opinion toward more justified understanding (Barkhordari et al., 2014). Accordingly, the present finding that Socratic dialectic was especially effective in activating cognitive engagement can be explained by its capacity to make students responsible for the reasons underlying their claims rather than allowing them to remain passive recipients of information.

The findings also showed that Socratic dialectic had a particularly strong effect on conceptual clarification and contradiction detection. This result is understandable because Socratic questioning frequently proceeds through requests for definitions, examples, counterexamples, and logical consequences. Through this process, learners discover whether a concept is overly broad, too narrow, internally inconsistent, or dependent on hidden assumptions. Practical applications of the Socratic method in classrooms have similarly emphasized that well-designed questions can reveal misconceptions, deepen discussion, and guide students toward more precise conceptual understanding (Cheraghian, 2025). The use of the Socratic method in teachers' instruction has also been associated with greater student participation and more reflective engagement with the content of learning (Eidi et al., 2024). Furthermore, Socratic teaching has been identified as an effective approach to teaching thinking because it requires learners to explain not only what they think but also how and why they arrived at a particular conclusion (Hani, 2024). These studies support the interpretation that the Socratic method strengthens cognitive processing by externalizing the reasoning process and subjecting it to dialogical examination.

The prominence of Socratic dialectic in metacognitive awareness and cognitive flexibility also aligns with previous findings. Metacognition requires learners to monitor their own beliefs, recognize uncertainty, identify weaknesses in their reasoning, and revise judgments when stronger evidence becomes available. Socratic dialogue directly activates these processes by confronting students with alternative perspectives and requiring them to reconsider

their initial positions. Research on questioning strategies has shown that Socratic questions can develop critical thinking when they encourage children to interpret, compare, infer, evaluate, and revise rather than merely recall information (Kanat & Temel, 2025). The effect of Socratic questioning on students' cognitive structures in algebra similarly indicates that guided questioning can help learners reorganize prior knowledge and reconstruct incomplete reasoning (Bimantara et al., 2025). Moreover, the association of Socratic questioning with cognitive curiosity and historical empathy suggests that this method can increase openness to alternative viewpoints and deepen engagement with unfamiliar experiences (Nemt-allah et al., 2026). These findings help explain why Socratic dialectic emerged in the present study as particularly suitable for developing flexible, reflective, and self-corrective cognition.

The results concerning Cartesian analysis revealed a different pattern. Cartesian analysis was most effective in the decomposition of complex problems, logical sequencing, evidence evaluation, inference, and cognitive accuracy. This pattern is directly consistent with the methodological principles associated with Cartesian reasoning. Descartes' philosophical method is based on withholding assent from doubtful claims, dividing complex difficulties into simpler elements, ordering thought from simple to complex, and reviewing the sequence to prevent error or omission (Descartes, 2025). In educational contexts, these principles can reduce cognitive overload by transforming an ambiguous or multidimensional problem into a series of manageable analytical tasks. The superiority of Cartesian analysis in procedural organization found in the present study therefore reflects its explicit concern with the order, clarity, and verification of reasoning.

The effectiveness of Cartesian analysis in strengthening critical and creative thinking has also been supported in previous educational research. An active integrated teaching method based on Cartesian doubt was found to improve critical thinking in mathematics by encouraging students to question assumptions and verify the validity of procedures rather than accept them automatically (Ghanei et al., 2015). A related study reported positive effects on both creative and critical thinking, suggesting that doubt can function not only as a restrictive mechanism but also as a stimulus for exploring alternative solutions and testing their adequacy (Ghanei & Eslami Moghadam, 2016). These findings are consistent with the present result that Cartesian analysis contributes to both error control and inferential reasoning. When students are trained to suspend premature judgment,

identify the components of a problem, and examine each step independently, they become less vulnerable to intuitive error, omission, and unsupported generalization.

At the same time, the findings showed that Cartesian analysis had limitations in relation to holistic, contextual, and emotional-cognitive processing. This result can be explained by the reductionist tendency inherent in excessive decomposition. Although dividing a problem into simpler parts facilitates analysis, it can also obscure relationships that become visible only at the level of the whole. Criticisms of Cartesian thought have emphasized that not all forms of knowledge can be organized according to the model of clear, distinct, and deductively ordered propositions. Vico's critique of Cartesianism, for example, drew attention to the historical, contextual, and constructed dimensions of human understanding (Darbanian & Abdolkarimi, 2022). The present findings similarly suggest that Cartesian analysis is most effective when used as one stage of cognitive processing rather than as a complete educational model. Without a subsequent process of reconstruction, analytical decomposition may result in fragmented knowledge and may be insufficient for social, ethical, or interdisciplinary problems.

The findings concerning Spinozist synthesis demonstrated that this method was strongest in causal-relational reasoning, systems thinking, knowledge coherence, and emotional-cognitive integration. These results are consistent with the central structure of Spinoza's philosophy, in which adequate understanding depends on recognizing the causal and necessary relations among phenomena. Spinozist thought rejects the separation of mind, body, emotion, and action into entirely independent domains and instead interprets them as interconnected expressions within a unified order (Saberi Varzaneh et al., 2020). From an educational perspective, this orientation encourages students to move beyond isolated facts and examine how concepts, causes, contexts, and consequences form a broader network. The strong performance of Spinozist synthesis in systems thinking can therefore be explained by its emphasis on interdependence rather than fragmentation.

The contribution of Spinozist synthesis to emotional-cognitive integration is also theoretically significant. In Spinoza's philosophy, emotions become more manageable when their causes are understood, and greater freedom is achieved through the formation of more adequate ideas. Moral education from a Spinozist perspective therefore involves the transition from passive reactions to rational and

causal self-understanding (Dehghan-Khalili, 2018). This theoretical framework supports the present finding that Spinozist synthesis may strengthen learners' ability to connect affective experience with reflective judgment. Such integration is especially important in philosophical education because many classroom inquiries concern moral dilemmas, interpersonal conflicts, identity, justice, and other topics in which cognition and emotion cannot be meaningfully separated.

The result that Spinozist synthesis requires a higher level of abstraction and instructional scaffolding is also understandable. Synthetic reasoning is cognitively demanding because it requires students to preserve distinctions among components while simultaneously identifying their relations within a larger structure. If students attempt synthesis before sufficient analysis, they may produce vague associations, unsupported causal claims, or generalized conclusions. The importance of conceptual precision in the interpretation of Spinoza has been highlighted in critical examinations of translations of the *Ethics*, where inaccurate rendering of key terms can distort the systematic relationships among concepts (Nikzad, 2025). This issue has educational implications because the effective use of Spinozist synthesis depends on careful differentiation between causal relation, correlation, similarity, and conceptual inclusion. The method therefore becomes more effective when teachers use concrete examples, visual models, causal maps, and gradual progression from simple relationships to more complex systems.

One of the most important findings of the study was that the integrated Socratic–Cartesian–Spinozist model provided greater cognitive coverage than any single method. This model begins with Socratic questioning to identify the problem, expose assumptions, and generate the need for inquiry. It then uses Cartesian analysis to divide the problem, organize evidence, and verify inferential steps. Finally, Spinozist synthesis reconnects the analyzed elements into a coherent relational and causal structure. This sequence corresponds closely to contemporary conceptions of philosophical inquiry as a process involving questioning, reasoning, evaluation, problem solving, reflection, and reconstruction. Programs of Philosophy for Children have been shown to improve critical thinking through philosophical inquiry and problem-solving activities (Isiklar & Ozturk, 2022). Meta-analytic evidence also indicates that philosophy-based programs can positively influence children's cognitive development, particularly when they are sustained, structured, and actively facilitated (Wei & Chen,

2025). A scoping review similarly concluded that philosophical inquiry is effective in developing critical thinking when learners are required to justify claims, examine alternatives, and engage in disciplined reflection (Looti & Abd-Alzim, 2025).

The integrated model also corresponds to the broader literature on thinking skills. Effective cognitive education includes more than criticism or analysis alone; it requires information processing, reasoning, evaluation, problem solving, reflection, creativity, and transfer (Jeffries & Hancock, 2011). The positive effects of philosophizing on cognitive flexibility and proactive inhibition further demonstrate that philosophical activity can influence executive processes involved in shifting perspectives and regulating automatic responses (Hamidi & Otoufati Roudi, 2021). Similarly, philosophical thinking skills have been strengthened through inquiry-based teaching in elementary education, supporting the value of educational environments in which students actively investigate rather than merely reproduce information (Kazemlou et al., 2023). The present findings extend these studies by showing that different philosophical traditions may contribute to different phases of the cognitive process and that their systematic combination may be more educationally effective than undifferentiated philosophical dialogue.

The findings also have implications for the distinction between direct teaching and active philosophical instruction. Direct teaching can efficiently communicate organized knowledge, but it may offer limited opportunities for students to question, decompose, reconstruct, and regulate knowledge independently. Comparative analysis of the philosophical foundations of cooperative and direct teaching models shows that instructional methods differ according to their assumptions about learner agency, social interaction, and the nature of understanding (Mehrijou & Babaei Touski, 2025). The present findings support an active model in which the teacher does not withdraw from instruction but assumes a more complex role as facilitator, cognitive organizer, and conceptual mediator. In the Socratic stage, the teacher structures dialogue and ensures that questions lead to deeper reasoning. In the Cartesian stage, the teacher models decomposition and verification. In the Spinozist stage, the teacher supports integration and helps students construct coherent explanations.

The results further suggest that philosophical education should not treat “critical thinking” as a single and uniform ability. Comparative research has shown that students from different philosophical traditions may develop different

patterns of critical reasoning (Chagalakonda, 2024). Philosophical and interpretive comparisons across epistemological traditions also indicate that systems of thought differ in how they define knowledge, certainty, justification, and the relation between reason and other sources of understanding (Sharifi et al., 2023). The current study similarly found that Socratic, Cartesian, and Spinozist methods represent different cognitive architectures. Socratic dialectic emphasizes dialogical criticism, Cartesian analysis emphasizes procedural control, and Spinozist synthesis emphasizes relational coherence. Recognizing these differences can prevent the reduction of philosophical education to a general discussion method and can support more deliberate alignment between philosophical procedure and intended cognitive outcome.

Overall, the findings indicate that the effectiveness of philosophical methods is conditional rather than absolute. Socratic dialectic may become unfocused when questioning is not carefully facilitated; Cartesian analysis may become mechanical when decomposition is treated as an end in itself; and Spinozist synthesis may become vague when integration is attempted without sufficient conceptual differentiation. The most effective application is therefore adaptive and sequential. Teachers should select and combine methods according to the nature of the problem, the students’ developmental level, the complexity of the content, and the intended cognitive skill. The integrated model proposed in this study offers a framework in which critical inquiry, analytical precision, and systemic understanding are not competing aims but interdependent dimensions of mature cognitive processing.

The present study was limited by its qualitative, documentary, and theoretical design. Because the analysis was based on philosophical texts and existing educational studies, the proposed comparative judgments were interpretive and were not tested through direct observation of classroom behavior or experimental measurement of student outcomes. The corpus included sources with different disciplinary orientations, publication formats, and levels of methodological rigor, which may have influenced the relative visibility of particular cognitive components. The educational application of Spinozist synthesis was also less extensively represented in the empirical literature than Socratic questioning and Cartesian doubt, making some of its instructional implications more theoretically inferred. In addition, the boundaries among questioning, analysis, inference, synthesis, and metacognition were not always completely distinct, and some coded units could reasonably

be assigned to more than one cognitive category. The model should therefore be understood as a conceptually grounded framework rather than a definitive causal account of educational effectiveness.

Future studies should empirically evaluate the integrated Socratic–Cartesian–Spinozist model through experimental, quasi-experimental, longitudinal, and mixed-method designs. Researchers could compare classrooms using each method separately with classrooms using the integrated sequence and assess outcomes such as critical thinking, analytical reasoning, systems thinking, cognitive flexibility, metacognitive awareness, problem solving, and transfer of learning. Further studies should examine whether the effectiveness of the methods varies according to age, academic subject, prior achievement, verbal ability, cultural context, and teacher experience. The development of standardized instructional protocols and valid assessment instruments would make it possible to test the model more precisely. Classroom discourse analysis, think-aloud protocols, cognitive mapping, interviews, and observation could also be used to identify how students move from questioning to decomposition and synthesis during actual learning tasks.

Teachers and curriculum designers should avoid using philosophical dialogue as an unstructured conversation and should instead organize inquiry around clearly differentiated cognitive phases. Lessons can begin with open Socratic questions that expose assumptions and generate conceptual uncertainty, continue with Cartesian decomposition of the problem into manageable elements, and conclude with Spinozist reconstruction of the relationships among those elements. Teachers should model each phase explicitly, provide visual organizers, encourage equal participation, and use developmentally appropriate examples. Students should be given opportunities to explain their reasoning, evaluate evidence, revise judgments, construct causal maps, and summarize how the parts of a problem form a coherent whole. Professional development programs should also prepare teachers to facilitate dialogue, manage disagreement, scaffold complex reasoning, and assess not only final answers but also the quality of students' cognitive processes.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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