

A Study on the Enhancement of Philosophical Literacy Driven by Generative AI: Taking the Cultivation of Dialectical Thinking in Marxist Philosophy Courses as a Starting Point

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Abstract

In university classrooms, the Marxist Philosophy course bears the responsibility of cultivating students' philosophical literacy and dialectical thinking, but it also faces practical difficulties such as abstract concepts, disconnect from case studies, and insufficient student participation. The rapidly developing generative artificial intelligence (AI) of recent years has brought new tools to the classroom, but it also carries the risk of using only answers and no longer thinking. This paper takes the collaborative practice of generative AI-dialectical thinking as its main thread, and, guided by Marxist dialectics, proposes a three-loop advancement model of contradiction-connection-development, combining it with the Prompt-Reasoning-Critique-Refine (PRCR) cycle to construct a closed-loop teaching system that runs through pre-class, in-class, and post-class activities. From the perspectives of theoretical foundation, instructional design, process mechanisms, and quality assurance, the paper systematically discusses how generative AI, while adhering to Marxist positions, viewpoints, and methods, can serve as a scaffolding rather than a substitute for students to conduct contradiction analysis, connect history and reality, and engage in critical reflection. It also provides directly usable prompt templates and rubric examples. Research shows that as long as there are clear teaching objectives, appropriate process design, and necessary normative constraints, generative AI will not only not weaken students' thinking ability, but will also help promote the growth of their dialectical thinking and the overall improvement of their philosophical literacy.

Keywords Generative Artificial Intelligence; Basic Principles of Marxism; Dialectical Thinking; Prompting Engineering; Academic Norms; Learning Loop

1 Research Origins and Core Issues: The Goal of AI + Marxist Philosophy with Dialectical Thinking as the Pivot

The wave of digitalization and intelligentization is changing the daily face of higher education. With the introduction of large-scale models into the classroom, students can easily generate courseware, abstracts, and draft papers in a short time, seemingly greatly improving efficiency [1]. However, teachers are also experiencing new contradictions in front-line teaching: on the one hand, students can use tools to give more professional answers; on the other hand, many students have not truly deepened their understanding of the questions themselves, and there is even a phenomenon of more and more answers, less and less thought [2]. The Marxist Philosophy course inherently bears the heavy responsibility of cultivating students' worldview and methodology, enhancing their philosophical literacy and dialectical thinking [3]. If generative AI appears merely as a machine that quickly provides answers in such a course, it will further weaken students' conscious grasp of contradictions, connections, and development [4]. The core issue this article aims to address is: how to transform dialectical thinking into the central hub for organizing teaching and using AI within the framework of AI+Marxist Philosophy, rather than a byproduct led by technology [5].

1.1 Problem Statement: From Memorizing Concepts to Learning to View Problems Dialectically

For a long time, Marxist philosophy classes have been labeled by students as abstract, difficult to understand, and far removed from real life. Many students can recite concepts fluently but struggle to use them to analyze problems around them [6]. Generative artificial intelligence (GAI) has significant advantages in text generation, viewpoint imitation, and scenario development, allowing students to easily have the system write a decent article. However, GAI also tends to take things for granted and cobble together answers, easily packaging vague and unproven content into text that seems reasonable [7]. Therefore, this study does not simply discuss whether or not to use GAI in the classroom, but rather re-examines the question from the perspective of cultivating dialectical thinking: how can GAI become a tool to help students ask questions, analyze, and reflect, rather than a black box that replaces students' thinking? This is also the starting point of this paper [8].

1.2 Conceptual Definition and Research Focus

In this paper, philosophical literacy mainly refers to students' ability to consciously apply dialectical thinking when facing real-world problems: to recognize contradictions, distinguish between primary and secondary issues, understand cause and effect, and be willing to compare and contrast history and reality, theory and practice. This study regards contradiction, connection, and development as the three key aspects of dialectics, and also transforms them into three operational steps in teaching [9]. In this article, generative AI mainly refers to dialogue systems based on large models. Its educational value does not lie in how many words it can write, but in its ability to help students build problem frameworks, generate different perspectives, and provide counterexamples and challenges, thereby artificially creating, amplifying, and sorting out cognitive conflicts in the learning process.

2 Theoretical Foundation and Logical Framework: Three-Ring Progression and PRCR Cycle

To ensure that AI truly serves the Marxist Philosophy course, we must first clarify: What are the theoretical foundations of this research? What is the basic pace of instructional implementation?

2.1 The Teaching Orientation of Marxist Dialectics

Marxist dialectics holds that the world is a unity of contradictions, that things are universally interconnected, and that they continually evolve through movement and development [9]. In the classroom, this can be translated into three key inquiries: first, contradiction analysis—what is the principal contradiction in a given problem or case, and what are its principal and secondary aspects; second, connection analysis—what kinds of interactions exist among the relevant elements, who influences whom, and whether these relations are mutually reinforcing or mutually constraining; third, development analysis—how contradictions will transform when conditions change and what new outcomes or stages may emerge [10]. The "three-ring advancement model" proposed in this article operationalizes these ideas as thinking actions that students can practice repeatedly: step one is identifying the conflict, encouraging students to state the focal points of tension in concise language; step two is clarifying the connections by listing elements and relationships through simple diagrams or tables; step three is exploration and development, prompting students to imagine different possible paths of change under altered conditions [11]. Through this process, teachers no longer merely explain concepts, but turn them into analytical tools, helping students move from intuitive impressions toward well-grounded, structured judgments [12].

2.2 The Educational Value of Generative AI

Within the three-ring advancement framework (contradiction–connection–development), the educational value of generative AI does not lie in providing ready-made conclusions, but in serving as a cognitive scaffold that helps students surface conflicts, organize relations, and test developmental paths. In Marxist philosophy classrooms, its value can be operationalized through three aligned functions (see Table 1).

Table 1. Alignment between generative AI functions and dialectical thinking training

AI-supporting function	Dialectical thinking goal	Typical classroom activity	Observable learning evidence
Dialogue & multi-role output	Identify principal/secondary contradictions and their aspects	AI plays roles such as capitalist, worker, economist, environmentalist, and historian, offering competing claims; students compare and adjudicate the principal contradiction	Principal-contradiction judgment sheet; list of conflicting viewpoints with reasons
Scaffolding structured expression	Build an element–relation holistic schema	AI outputs a problem–viewpoint–reason–refutation draft; students revise, delete, and supplement with evidence	Argument structure diagram; revision traces; evidence-to-claim mapping
Generating counterexamples & extreme scenarios	Conduct developmental deduction under changing conditions	After students state initial conclusions, AI deliberately provides counterexamples or extreme cases; students re-check premises and redraw scenario trees	Counterexample response table; condition–path–outcome deduction table

Dialogue and role-playing.

Dialectical learning begins with recognizing contradictions in concrete situations. By assigning AI different social, historical, or disciplinary roles, teachers can quickly generate competing standpoints around the same issue. This multi-role dialogue helps students grasp the multifaceted nature of contradictions—that is, how one object contains different sides and levels of tension—while also acquiring diversified perspectives through comparison. Students are then required to decide what counts as the principal contradiction and justify why it is principal, turning dialogue into a disciplined contradiction-analysis task.

The auxiliary tension of structured expression.

A typical difficulty in philosophy learning is that students often feel a viewpoint but cannot express it in a coherent argumentative form. Structured AI outputs (e.g., problem–viewpoint–reason–refutation) provide a visible argumentative skeleton, creating an auxiliary tension that pushes students to fill gaps, clarify causal relations, and attach evidence. The key is that students must revise AI drafts rather than accept them, so that argumentative structure becomes a repeated practice rather than a one-time product.

Generating counterexamples and extreme scenarios.

Dialectical thinking requires testing whether a conclusion holds under different conditions. After students propose an initial judgment, AI can be prompted to offer counterexamples, boundary cases, or opposing logics. Such deliberate negative generation creates productive cognitive conflict, forcing students to inspect hidden premises, specify validity conditions, and, if necessary, reconstruct the scenario tree of possible developments. In this way, developmental deduction becomes a teachable and checkable process.

Taken together, these three functions form a coherent learning chain: conflict surfacing→relation structuring→conditional re-testing, which corresponds to the three rings of contradiction, connection, and development. To prevent tools overriding thinking, AI use should still be embedded into the three-stage teaching rhythm of pre-class prompting, in-class conflict utilization, and post-class verification and standardization, ensuring that AI remains a scaffold for dialectical practice rather than a substitute for it.

2.3 Three-ring Propulsion Model and PRCR Cycle

To facilitate implementation in teaching practice, this paper couples the three-ring advancement model with the PRCR learning cycle. PRCR refers to a four-step progression of dialectical learning actions: Prompt (Asking Questions), where students formulate clear prompts and problem statements under the teacher's guidance; Reasoning, where students use AI and peer discussion to collect evidence, comparisons, and causal explanations; Critique, where they deliberately search for loopholes, counterexamples, and hidden premises; and Refine, where viewpoints are revised and evidence is supplemented to form more stable conclusions or texts. The three-ring model answers what to look at and how to think from the dialectical perspective—namely, contradiction identification, holistic connection construction, and developmental deduction—while PRCR answers in what order to advance learning and assignments. Their coupling builds a content–process integrated framework: students open a dialectical problem through Prompt, expand element–relation reasoning through Reasoning, challenge premises and paths through Critique, and re-stabilize judgments through Refine, thereby forming a closed loop of repeated dialectical practice. This coupling is illustrated schematically in Figure 1, where the upper layer represents the three rings (contradiction–connection–development) and the lower layer represents the PRCR process (Prompt–Reasoning–Critique–Refine), with arrows indicating their stage-by-stage correspondence. With this framework, classic Marxist philosophy themes—such as commodity

value, productive forces and relations of production, consciousness and matter, and the people's position as historical subjects and their practice—can be designed as combined modules of problem domain—evidence materials—charts/scenarios, ensuring that AI-supported learning always returns to dialectical goals rather than becoming a mere tool for producing answers.

3 Teaching Model and Curriculum Design: Constructing a Generative Closed Loop of Pre-class-in-class-post-class

Based on the above theoretical framework, the key is to translate these concepts into concrete teaching practices. This chapter illustrates this through three stages: goal design, pre-class, in-class, and post-class activities, and a typical case study.

3.1 Consistent Design of Objectives, Content, and Evaluation

To ensure that generative AI functions as a scaffold for dialectical learning rather than a shortcut to answers, the course must align learning objectives, teaching content, and assessment evidence. In this study, dialectical thinking is operationalized into three observable and repeatable actions corresponding to the three rings of contradiction—connection—development: Contradiction Analysis, where students identify the principal contradiction, secondary contradictions, and their aspects in a concrete case and justify why it is principal, with AI providing multi-role standpoints for comparison; Holistic Connection, where students construct an element-relation map (at least five elements and several promoting/restricting/transforming relations), revising AI-suggested elements and links to form a systemic schema; and Developmental Deduction, where students design at least two condition-change scenarios and deduce how contradictions may transform, using AI-generated counterexamples or boundary cases to recheck premises and redraw scenario trees. Each action requires corresponding evidence—principal-contradiction judgment sheets, element–relation diagrams with annotations and revision traces, and condition–path–outcome deduction tables—so that dialectical reasoning is made teachable and visible.

Based on this operationalization, each classic Marxist philosophy theme—such as commodity value, productive forces and relations of production, consciousness and matter, and the people's position as historical subjects and their practice—should be designed as a combined module of problem domain—evidence materials—charts/scenarios, ensuring AI-assisted learning always returns to concrete dialectical tasks rather than drifting into general discussion. Assessment must follow the same alignment: students keep PRCR process logs to record how their Prompt, Reasoning, Critique, and Refine steps change their judgments; periodic assignments evaluate the quality of contradiction sheets, relation maps, and scenario deductions against clear rubrics (evidence-grounded principal-contradiction identification, systemic relation explanation, explicit premises and transformation mechanisms); and a final transfer task asks students to apply the same three-ring/PRCR procedure to a new case and explain how contradictions shift under changing conditions. Through this objective–task–evidence–rubric chain, generative AI becomes a reliable scaffold for philosophical literacy instead of a substitute for students' reasoning.

3.2 Pre-class Preparation: Scenario Planning and Prompting Strategies

The focus of the pre-class stage is to ask the right questions rather than generate the answers from the outset. Teachers can select historical materials and real-world cases related to the course theme in advance, such as a hot topic, a policy adjustment, or a business practice, and guide students to use a simple table to initially organize the three aspects of contradiction–connection–development.

Based on this, teachers can provide several semi-finished prompt templates, such as:

Please analyze from the perspective of 'contradiction'... What is the main conflict? What are the secondary contradictions?

Please list the key elements related to this issue and explain whether they promote each other, restrict each other, or transform into each other.

If conditions change (such as policy adjustments, technological upgrades, etc.), what different development paths might emerge?

Students can make slight modifications to the template and then input it into the AI to generate preliminary analyses or viewpoints from different perspectives. Teachers can then use these results to understand students' interests and questions, preparing seed questions for classroom discussions.

3.3 In-class: Human-computer Interactive Debate and Multi-directional Rebuttal

In the classroom, discussions can be organized using a role-process approach. For example, some students can role-play different groups from different historical periods (workers, capitalists, reformers, etc.), while AI can play roles such as economist and sociologist, offering their opinions on the same issue. The teacher is then responsible for guiding the scattered dialogue in a direction of contradiction-connection-development.

A typical process is:

Each party presented its position, stating, I believe the main contradiction is... and providing reasons;

Students or AI can proactively pose hypothetical questions, such as What would happen if the relations of production were changed first?

The whole class worked together to update the Element-Relationship Diagram and Scenario Tree on the blackboard or in a shared document, recording the key points and disagreements in the discussion;

Write down the most typical disagreements and problems in the PRCR log as a starting point for homework.

In this process, the role of AI is not to declare who is right and who is wrong, but to continuously provide supplementary materials, counter-questions, and counterexamples, so that students have materials and opponents to practice looking at problems dialectically.

3.4 Post-Class Activities: Academic Expression and Reflection

The task after class is to transform the live discussions in class into presentable academic expressions. To this end, a concise writing framework can be provided, for example:

Abstract—Problem Statement—Related Research or Background—Contradiction Analysis—Connections and Structure—Development Scenario and Limitations—Conclusion and Reflection

It also includes a concise self-assessment checklist, such as:

Have I clearly explained the principal contradiction and the secondary contradiction?

Have I considered at least one counterexample or opposing viewpoint?

Have I explained under what conditions my conclusion holds true, and under what conditions it might not hold true?

Have I properly cited data, materials, and the involvement of AI?

Based on this, students Refine their viewpoints and texts, and the teacher then provides feedback based on the rubric, looking at both how well the result is written and whether the process was carefully considered.

3.5 Typical Theme Examples

This paper selects cross-border e-commerce logistics as a teaching scenario that is close to students' daily experiences. The reason for choosing this topic is not to teach specific business skills, but to guide students to practice dialectical thinking in familiar real-world problems by using the conflicts and trade-offs that can be found everywhere in it.

In the first segment, the teacher focused the question on the tension between customer experience and corporate profits. By briefly introducing intuitive information such as delivery time, shipping costs, and return/exchange rates, the teacher guided students to answer in their own words: In the current situation, which set of contradictions is most prominent? Why is it called the principal contradiction? Students were encouraged to connect with their life experiences and simple facts, rather than relying on vague slogans.

In the second part, instead of requiring students to create complex models, teachers asked them to draw a factor-relationship diagram in the simplest way: write down key elements such as platform policies, logistics channels, customs clearance efficiency, consumer expectations, and after-sales service on paper, and use arrows or lines to indicate who affects whom and who depends on whom. Through this visualization activity, students can more intuitively see that the fragmented impressions that were originally scattered in their minds are actually an interconnected and mutually restrictive whole.

In the third part, the teacher sets up several hypothetical scenarios of what if, such as the platform strengthens its timeliness assessment, a country adjusts its tariff policy, and the introduction of new warehousing technologies. Students are invited to discuss in groups: Under different conditions, will the original main contradiction change? Will new contradictions emerge? Which practices are beneficial in the short term but may bring hidden dangers in the long term? Through such deduction, students can understand that a developmental perspective is not simply optimism, but rather seeing how changes in conditions reshape the overall situation.

After completing the three steps above, students are required to write a short report summarizing their discussion process and final conclusions. The report does not require calculating the optimal solution, but rather aims to clearly explain how they defined the contradictions, understood the relationships between the various elements, and made judgments and trade-offs among multiple possible paths. Students are also required to cite the references and AI tools used at the end of the report, fostering a preliminary habit of respecting facts and expressing themselves in a standardized academic manner. When evaluating the report, teachers prioritize whether this dialectical thinking and awareness of standards are reflected in the report, rather than simply judging which business idea is more appealing.

4 Process Mechanisms, Quality Assurance, and Risk Governance: Let AI Act as Scaffolding, Not a Substitute

Without proper process design and quality control, AI can easily degenerate into a mere homework-writing service. This chapter discusses how to ensure AI truly serves student growth from four aspects: cognitive mechanisms, prompting engineering, academic norms, and evaluation methods.

4.1 Cognitive Mechanism: From Conflict-Driven to Method Internalization

This article understands the improvement of students' philosophical literacy as a process of conflict-reorganization-internalization.

First, by deliberately creating moderate conflict through human-computer dialogue, students can realize that there is more than one answer to a question;

Secondly, use charts, lists, and other forms to help students reorganize their ideas and transform scattered viewpoints into structured analyses.

Finally, after repeated practice, students gradually develop a relatively stable operational habit and are able to proactively examine new problems from the perspectives of contradiction, connection, and development.

In this process, both teachers and AI act as scaffolding: providing support, raising questions, and pointing out loopholes, but not taking away the right to make the final judgment.

4.2 Prompt Design and Dissenting Questioning Mechanism

In the PRCR cycle, the criticism stage can be implemented through a contrarian questioning mechanism. This contrarianism is not intended to negate the student, but rather to consciously assign a role that always asks questions from the opposite direction, helping the student identify weaknesses in their argument.

The specific approach is as follows: The prompts are pre-arranged so that the generative AI takes the opposing viewpoint, specifically nitpicking and questioning the student's arguments. For example, it is required to point out: which concepts are used inaccurately, what logical leaps occur in the argumentation, which conclusions lack factual or documentary support, and what real-world scenarios might serve as counterexamples. Subsequently, the teacher requires the student to address these criticisms point by point in the revised draft, either by providing additional evidence, clarifying the premises, or acknowledging the limitations of the original judgment.

Through this kind of contrarian questioning, AI is no longer just a tool to help students finish their essays, but becomes an external force for training critical thinking: on the one hand, it continuously creates mild cognitive discomfort to prompt students to leave their comfort zones; on the other hand, it allows students to gradually develop a more conscious and rigorous attitude towards the use of concepts, argumentation structures, and evidence in the process of responding to questions multiple times, thereby truly internalizing dialectical thinking into their own thinking habits.

4.3 Academic Norms and Ethical Compliance

The deployment of generative AI in Marxist philosophy teaching should avoid over-technical platform dependence. For humanities teachers, the goal is not to build complex systems, but to secure a low-threshold, dialogue-centered environment in which AI can reliably support the PRCR cycle and the three-ring dialectical tasks. Therefore, this paper recommends prioritizing tools that offer Socratic questioning, process guidance, and easy integration with teachers' existing materials, rather than tools requiring programming or engineering maintenance.

In practice, humanities teachers can embed it into the PRCR loop with minimal preparation: before class, teachers provide half-finished prompts aligned with contradiction-analysis tasks; during class, Study Mode is used to generate competing standpoints and to ask why-type follow-ups that push students to justify principal contradictions; after class, it supports Critique and Refine by continuously requesting counterexamples, boundary conditions, and evidence mapping. Because Study Mode accepts uploaded texts or PDFs for reference, teachers may directly use their existing readings or case packets without converting them into technical formats. Using such dialogue-oriented tools does not reduce teachers' pedagogical authority; instead, it frees teachers from technical burdens and allows them to concentrate on dialectical guidance: setting the problem domain, verifying evidence, and evaluating students' contradiction sheets, relation maps, and developmental deductions. At the same time, teachers should require students to document AI use in PRCR logs and to mark AI-assisted parts in final reports, so that platform convenience does not weaken academic responsibility.

4.4 Evaluation System and Evidence Management

To avoid evaluations becoming merely subjective impressions, this paper proposes an evaluation method based on process records + multiple pieces of evidence.

Process records include PRCR logs, classroom discussion records, and revision notes, which are used to observe the trajectory of changes in students' thinking.

Multiple forms of evidence, including charts, counterfactual lists, citation lists, and final texts, are used to support teachers' scoring decisions.

Evaluation no longer focuses solely on how well the final paper was written, but also considers the thought process and revision process the student went through.

5 Implementation Measures, Resource Development and Promotion Path

For the above model to be truly implemented, it needs to be supported by several aspects, including curriculum, resources, and teaching organization.

First, within a single Marxist Philosophy course, several minimum reusable units are developed, such as: a problem domain modeling template, a set of typical cases and prompt examples, and a dialectical analysis rubric. These units can be embedded into existing teaching platforms: task cards are released before class, the human-computer collaborative debate process is recorded during class, and self-evaluation and peer evaluation are conducted after class.

Secondly, at the resource level, a shared resource library can be gradually built, including: case studies and materials categorized by theme and difficulty, a course-competency mapping table, and standardized checklists and prompt templates. This allows different teachers within the same department, or even between different departments, to flexibly adjust the content and difficulty within a common framework.

Secondly, at the teaching organization level, experience sharing can be promoted through a process of collective lesson preparation - peer observation - results presentation. For example, a centralized discussion can be held at the beginning of each semester to review typical cases and problems from the previous semester; cross-class observation and peer evaluation can be arranged during the semester; and teaching reflection can be conducted at the end of the semester using anonymized student work and rubric results.

Finally, regarding the promotion path, a deep pilot program can be launched in 1-2 core courses first, then gradually expanded to related courses within the same subject group, and finally extended to interdisciplinary elective courses. During this process, it is important to control student workload and teacher workload by setting minimum mandatory requirements and optional extension tasks to ensure the model's promotion is both stable and sustainable.

6 Conclusion and Outlook

This paper explores the introduction of generative AI into the teaching of Marxist philosophy, focusing on the core concept of dialectical thinking. By constructing an overall framework of three-ring advancement + PRCR cycle, this study attempts to answer two key questions: first, how to rationally use AI while adhering to the Marxist stance, viewpoints, and methods; and second, how to transform the seemingly abstract goal of philosophical literacy into an observable, trainable, and evaluable learning process.

Based on existing practices, as long as the principle that AI is scaffolding, not a substitute is clearly defined, and the analysis of contradictions, overall connections, and developmental deductions are organically integrated into the classroom in instructional design, it is possible to guide students' reliance on AI into their conscious application of methods. Future work can be further explored in three directions:

(1) To study more systematically the impact of different dialogue roles and prompting strategies on the depth of students' thinking;

(2) Develop more intuitive visualization tools for the argument chain to help students clearly present and review their thinking process;

(3) Continuously track the implementation effect of this model in multiple schools and multiple courses, and continuously revise and improve the relevant rubrics and processes through long-term and detailed case accumulation.

As long as we adhere to the bottom line in theory and constantly reflect and adjust in practice, generative AI can play the role of both amplifier and stabilizer in the Marxist Philosophy classroom: amplifying students' awareness of problems and dialectical perspective while stabilizing academic norms and value bottom lines, thereby truly promoting the transformation of philosophical literacy into dialectical ability to face real-world problems.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Biographies

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生成式AI驅動的哲學素養提升研究 ——以馬原課程中的辯證思維培育為切入點

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摘要：在高校課堂中，「馬原」課程一方面承擔着培養學生哲學素養和辯證思維的任務，另一方面又面臨概念抽象、案例脫節、學生參與度不足等現實困難。近年來迅速發展的生成式人工智能，為課堂帶來了新的工具，同時也帶來了「只用答案、不再思考」的風險。本文以「生成式AI—辯證思維」的協同實踐為主線，在馬克思主義辯證法的指導下，提出「矛盾—聯繫—發展」的三環推進模式，並將其與「Prompt-Reasoning-Critique-Refine (PRCR)」循環相結合，構建了一個貫穿課前、課中、課後的教學閉環。文章從理論基礎、教學設計、過程機制與質量保障等方面，對生成式AI如何在堅持馬克思主義立場、觀點和方法的前提下，成為學生開展矛盾分析、歷史與現實結合、批判性反思的「腳手架」而非「替身」進行了系統論述，並給出了可直接使用的提示模板和量規示例。研究表明，只要有清晰的教學目標、適當的流程設計和必要的規範約束，生成式AI不僅不會削弱學生的思考能力，反而有助於促成其辯證思維的生長和哲學素養的整體提升。

關鍵詞：生成式人工智能；馬克思主義基本原理；辯證思維；提示工程；學術規範；學習閉環

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