The Reshaping of Generative Artificial Intelligence on University Students' Cognitive Autonomy and Its Educational Response

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Abstract: The deep integration of generative artificial intelligence is systematically reshaping university students' cognitive autonomy, triggering profound transformations in higher education practices. From the perspective of critical technology theory, this study analyzes the internal mechanisms through which generative AI reshapes cognitive autonomy by altering the pathways of accessing cognitive resources, externalizing the organizational logic of cognitive processes, and reconstructing the basis for judging cognitive authority. This reshaping process gives rise to three major educational risks: structural imbalance in cognitive abilities, endogenous erosion of academic ethical integrity, and difficulties in constructing learners' subjective identity. To address these challenges, it is imperative to promote a shift in educational paradigms centered on cultivating "critical cognitive autonomy." This entails reorienting educational objectives from tool application to competency development, redesigning deep learning environments that incorporate critical dialogue, and fundamentally transforming the role of teachers into facilitators and interpreters. Such measures will guide students in maintaining and developing their irreplaceable cognitive agency and value judgment within the new human–machine collaborative cognitive ecology.

Keywords: Generative Artificial Intelligence; University Students; Cognitive Autonomy; Educational Response; Higher Education

1. Introduction

The rise of generative artificial intelligence (AIGC) signifies that the development of intelligent technology has entered a new stage centered on content creation and conversational interaction. With the widespread global adoption and application of large language models represented by ChatGPT, their influence has rapidly permeated the field of higher education, profoundly altering traditional models of knowledge production, dissemination, and acquisition. For university students, who are in a critical period of values formation and cognitive development, generative AI is no longer merely an external information retrieval tool. It is increasingly evolving into a "cognitive partner" or "simulated mentor" deeply embedded within their learning processes, capable of directly providing explanations, generating text, answering questions, and even inspiring ideas [1]. This unprecedented level of close human-machine interaction, while offering students personalized learning support and convenience for creative expression, has simultaneously sparked a series of deep concerns regarding cognitive agency, independent thinking, and the essence of education.

Against this backdrop, the top-level design of China's education sector demonstrates keen foresight. The 2026 National Education Work Conference explicitly stated the need to "continuously deepen comprehensive education reform, deepen evaluation reform, solidly advance the empowerment of education by artificial intelligence, accelerate the universalization of AI general education across all educational stages, and stimulate the vitality and momentum for building a strong education system." This strategic deployment not only emphasizes the urgent requirement for technology-enabled educational innovation but also implies a clear awareness of the potential risks accompanying technology application and an expectation for proactive guidance. The fundamental purpose of deeply integrating AI into the education system is by no means to replace human thought with technology, but rather to cultivate innovative talents capable of

adapting to and leading future society more effectively through human-machine collaboration. Therefore, exploring how generative AI reshapes the cognitive autonomy of university students—the cornerstone of innovation—and constructing prudent yet proactive educational response strategies accordingly, constitutes a core theoretical and practical issue for current efforts to implement the education digitalization strategy and achieve the dialectical unity of "empowerment" and "cultivation."

Current academic research has approached this frontier from multiple dimensions. A portion of studies focuses on the impact of generative AI on students' specific learning behaviors and abilities. For instance, empirical research has explored its enabling mechanisms on university students' self-regulated learning behaviors [2], or analyzed its complex effects on critical thinking and self-directed learning capabilities [3]. Other speculative studies examine the educational transformations triggered by AI from a macro perspective, proposing the necessity of a philosophical reconstruction shifting from instrumental rationality to value rationality [4], or reflecting on the direction of learning based on theories such as embodied cognition [5]. These studies provide valuable empirical evidence and theoretical insights for understanding the educational impact of generative AI. Regarding the specific dimension of cognitive autonomy, existing discussions are either embedded within examinations of self-directed learning ability and critical thinking or touched upon from the macro levels of philosophy of technology and ethics, laying a foundation for subsequent research.

Cognitive autonomy refers to an individual's ability and tendency for self-direction, self-monitoring, and self-correction within cognitive activities, including the processes of knowledge acquisition, comprehension, evaluation, and creation. Its core lies in the individual's conscious awareness and active control over their own thought processes as a cognitive agent [6]. Within the new cognitive ecology constituted by generative AI, this autonomy is undergoing subtle yet profound reshaping. On one hand, the immediate and extensive cognitive scaffolding provided by technology can further enhance students' confidence and efficiency in exploring the unknown, formally expanding the boundaries of

cognition. On the other hand, excessive reliance on AI-generated feedback and uncritical acceptance of algorithmically produced content may also lead to risks such as cognitive inertia, homogenization of thought, and weakening of metacognitive abilities, potentially eroding the very foundation of cognitive autonomy in substance. This "ambivalent" effect, characterized by the coexistence of empowerment and disciplining, renders the contemporary situation of cognitive autonomy exceptionally complex.

In light of this, this paper argues that it is necessary to further enrich and expand the theoretical examination of the dynamic relationship between generative AI and university students' cognitive autonomy based on existing research. Moving beyond mere validation of effects or warnings of risks, this study aims to introduce the perspective of critical theory of technology, viewing generative AI as a cognitive-technical system that is not value-neutral but rather embeds specific logics and biases. It seeks to systematically analyze how, by mediating students' cognitive practices, generative AI systematically reshapes university students' cognitive autonomy across three levels: the acquisition of cognitive resources, the organization of cognitive processes, and the construction of cognitive authority. Furthermore, based on an understanding of this reshaping mechanism, the study explores how higher education should implement an educational response aimed at cultivating students' "critical cognitive autonomy" through conceptual renewal, curriculum and pedagogical reconstruction, and evaluation reform. The goal is to enable students, in their coexistence with powerful intelligent tools, not only to utilize their capabilities but, more importantly, to retain their capacity for independent thought, ultimately becoming sound and responsible cognitive agents and creators in the technological age.

2. The Intrinsic Mechanisms by Which Generative Artificial Intelligence Reshapes University Students' Cognitive Autonomy

As a new type of cognitive technology, generative artificial intelligence has become deeply integrated into the learning practices of university students. It is not merely a tool for providing information; rather, through its inherent technological logic and interactive

modes, it systematically alters the ways in which university students approach knowledge, organize their thinking processes, and establish the basis for judgment. This change touches the core of cognitive autonomy—the fundamental ability of individuals to engage in self-direction, self-monitoring, and self-correction during the knowledge-seeking process. Cognitive autonomy is both an objective of learning and a prerequisite for high-quality learning to occur. Its reshaping is subtle yet concrete, primarily realized through three interrelated dimensions: altering the pathways through which students acquire cognitive resources, changing the logic by which they organize cognitive processes, and shifting the basis upon which they establish cognitive judgments. A thorough analysis of these intrinsic mechanisms constitutes the epistemological prerequisite for understanding the current changes in educational contexts and formulating effective responses.

2.1 A Structural Shift in the Pathways for Acquiring Cognitive Resources among University Students

In traditional learning models, university students primarily rely on systematic course readings, library literature searches, teacher-student classroom interactions, and social practice observations to acquire knowledge resources. This process requires students to actively identify information needs, evaluate the reliability of information sources, and compare, discern, and synthesize a wealth of original materials. This series of proactive exploration behaviors is precisely the key link in exercising and demonstrating cognitive autonomy. The emergence of generative AI has provided university students with a distinctly different pathway to acquiring cognitive resources. Students can directly pose questions to the AI agent in any disciplinary domain using natural language dialogue and rapidly obtain a structured, linguistically fluent, summarized answer or initial draft text [7]. The prominent advantage of this pathway lies in its unparalleled convenience and high efficiency. It can help students quickly overcome entry barriers, gain an overview of a knowledge domain, and stimulate interest in further inquiry.

However, this shift in pathways also brings profound impacts on cognitive structure. The answers provided by the AI agent are not transparent retrievals from an objective knowledge base but are probabilistic modeling and generation based on its massive training data. The output content has undergone filtering, reorganization, and stylistic processing by the model's internal algorithms. Long-term reliance on this pre-processed knowledge supply may reduce students' opportunities to access and analyze original literature and primary sources. They may become accustomed to receiving integrated or even pre-interpreted conclusive information, while the development of their own core abilities to trace sources, conduct cross-validation, and engage in critical screening within complex information environments may gradually slow down. This does not mean these abilities will disappear, but rather that the practical contexts and frequency of exercising them are significantly altered by technological mediation. The foundational aspects of cognitive autonomy concerning how to seek information and how to assess its value face the risk of having their initiative partially taken over by the technological framework. Students' cognitive starting points increasingly begin with the version of information constructed by the AI agent.

2.2 An Externalization Tendency in the Organizational Modes of University Students' Cognitive Processes

Cognitive autonomy is manifested not only in what resources are acquired but also, more deeply, in the process of organizing thinking to solve problems. A complete cognitive process, such as completing an academic paper or solving a complex engineering problem, typically involves multiple iterative thinking stages including problem definition, solution conception, logical deduction, and testing-correction. This process is internal and complex, often accompanied by confusion, trial-and-error, and breakthroughs, serving as the arena where cognitive autonomy is tempered and demonstrated. The powerful generative capabilities of AI enable it to directly intervene and substantively participate in these thinking stages. When faced with learning tasks, students may tend to delegate specific cognitive labor, such as outlining, finding arguments, interpreting data, or even drafting sections, to AI for realization. This leads to the cognitive process, originally a continuous and coherent internal activity of the student subject, being fragmented and partially transferred to

interactions with the external AI agent, exhibiting an externalization tendency in the organization of cognitive processes.

In this context, AI plays the role of an efficient cognitive collaborator, capable of quickly generating text and solutions that conform to norms based on pattern recognition. However, this generation is essentially a reproduction and combination of existing data patterns, lacking deep thinking grounded in genuine understanding, situational insight, and value trade-offs. When students over-rely on this externalized mode of cognitive organization, their own mental capacities for sustained deep thinking, constructing rigorous logical chains, tolerating problem uncertainty, and iteratively optimizing through reflection face the challenge of underdevelopment due to insufficient practice [8]. Over time, the cognitive process may gradually evolve from an internal psychological activity requiring active navigation and responsibility into a technical operation of issuing instructions to and filtering results from an external intelligent tool. There exists a potential risk that the sense of control—the most crucial aspect of cognitive autonomy concerning how to think and engage in intellectual creation—could be weakened.

2.3 An Algorithmic Reconstruction of the Basis for Judging Cognitive Authority among University Students

A mature marker of cognitive autonomy lies in an individual's ability to independently form judgments and establish inner conviction—that is, an internal cognitive authority—based on rational criteria and reliable methods. Traditionally, the establishment of this authority stems from deep learning and internalization of disciplinary paradigms, scientific verification methods, logical rules, and diverse perspectives. The widespread use of generative AI introduces a new, powerful external reference point for judgment for university students. The responses generated by AI agents are often linguistically confident, logically coherent, and broad in content. For students initially encountering a field, these outputs can be highly persuasive and may even be subconsciously perceived as a form of authoritative reference.

This phenomenon may lead to a tendency towards an algorithmic reconstruction of the basis for judging cognitive authority. Some students, when evaluating the truthfulness of information or the value of viewpoints, might unconsciously prioritize the fluency and confidence of AI outputs or use them as a convenient yardstick for quickly validating their own ideas, relatively weakening more fundamental albeit time-consuming judgment processes such as consulting authoritative literature, conducting experimental verification, adhering to rigorous logical rules, and considering social-ethical values. When encountering conflicts between AI-provided answers and other information sources, including teacher explanations or academic literature, some students may feel confused or, without in-depth analysis, tend to accept answers that align more with the characteristics of the technological presentation. This profoundly affects the core of cognitive autonomy—the standards by which individuals ascertain their own knowledge. It is not a simple substitution of authority but may give rise to a hybrid cognitive state that has not been fully integrated through reason. Consequently, the process of establishing students' internal cognitive authority becomes more complex. They must develop higher-order metacognitive abilities and critical thinking amidst frequent interactions with technology to maintain and consolidate the independence of their own judgments. This challenge of preserving cognitive autonomy while coexisting with intelligent technology is a new subject that contemporary higher education must squarely address.

3. Examination of Key Educational Risks Arising from the Reshaping of University Students' Cognitive Autonomy

The reshaping of university students' cognitive autonomy by generative artificial intelligence is a dialectical process imbued with inherent tension. The cognitive convenience and expansive effects conferred by the technology coexist with its latent risks of erosion and substitution. Without clear theoretical examination and conscious educational guidance, this reshaping process will trigger a series of deep-seated and structural educational risks. These risks directly concern the core objective of talent cultivation in higher education, namely, fostering innovative individuals capable of independent thinking, possessing rigorous academic integrity, and having a sound sense of agency [9]. Therefore, it is imperative to move beyond superficial

discussions of technological utility and systematically analyze the three core risks potentially arising from the structural changes in cognitive autonomy: the imbalance in cognitive ability development, the erosion of academic ethical character, and the dilemma in constructing a sense of learning agency. Identifying these risks is an indispensable prerequisite for formulating effective educational response strategies.

3.1 The Risk of Structural Imbalance in University Students' Cognitive Ability Development

Cognitive autonomy is an internal state resulting from the synergistic interaction of various cognitive abilities. Healthy cognitive development relies on the balanced exercise and dynamic coordination of all ability dimensions in practice. The deep integration of generative AI, due to its efficient substitution of specific cognitive tasks, is disrupting this traditional equilibrium and inducing a structural imbalance in the development of university students' cognitive abilities.

This imbalance first manifests as a discrepancy between the development of lower-order information processing abilities and higher-order thinking and judgment abilities. Generative AI can efficiently perform tasks such as information retrieval, preliminary literature screening, text summarization, and basic code writing. This directly reduces opportunities for students to engage in hands-on operation and deep immersion in these foundational, procedural cognitive activities. The crucial training windows for exercising abilities such as information discrimination, systematic literature review, and foundational logic construction—which involve directly processing raw, complex, and even contradictory original materials—are being compressed.

In contrast, those higher-order abilities more dependent on uniquely human mental qualities—such as the ability to precisely define and pose problems in novel, complex situations; the ability to critically integrate and evaluate vast amounts of information; and the ability to conduct long-chain, rigorous logical deduction and creative construction—do not automatically improve synchronously with the presence of AI. In fact, their development faces greater challenges precisely because the foundational cognitive abilities supporting these higher-order thinking operations may be weakened due to lack of practice. The effectiveness of generative AI in empowering learning is highly dependent on learners' prior knowledge, cognitive abilities, and metacognitive level—their learning readiness. If students' foundational cognitive training is insufficient, their preparedness to use AI for deep learning is inadequate, and they may easily remain at the level of superficially accepting and simply reorganizing generated content.

Students' cognitive ability structure may trend towards an "outsourced," instrumentalized form: proficient at issuing instructions to machines and combining their outputs, yet exhibiting a hollowing out of core competencies and a lack of sustained innovative vitality in areas requiring transcending existing data patterns, and engaging in independent, deep, and responsible thinking. This structural imbalance risks producing graduates from higher education who are ill-suited to meet the fundamental needs of future society for complex problem-solvers and originators of original thought.

3.2 The Risk of Endogenous Erosion of University Students' Academic Ethical Character

Cognitive autonomy pertains not only to the strength of thinking ability but is also fully embodied in academic character and cognitive ethics [10]. A rigorous, honest, and responsible academic character is internalized through long-term practice involving confronting genuine cognitive dilemmas, adhering to academic norms, and assuming cognitive responsibility. While generative AI reshapes the cognitive process, it also poses a potentially erosive threat to this endogenous cultivation mechanism.

A primary concern is the blurring of academic integrity boundaries within the cognitive process. When AI can generate logically coherent and professionally phrased text, students' judgment of the boundaries between originality, borrowing, and plagiarism becomes exceptionally complex. Over-reliance on and uncritical use of generated content can weaken students' reverence for the core value of academic originality and their willingness to cherish and forge their own unique scholarly claims.

A deeper risk lies in the suspension and transfer of cognitive responsibility. True cognitive

autonomy means that the individual bears full responsibility for their own thought processes and their outcomes. When key links in cognitive activities are handed over to a "black box" system perceived as authoritative, students are prone to a diffusion of responsibility, attributing potential errors, biases, or inadequacies to the technological tool, thereby weakening their own sense of being the primary agent responsible for rigorous verification, reflection, and correction.

It is also necessary to guard against the distortion and failure of traditional academic training tasks due to technological dependence. This risk can trigger a decline in the appreciation of intellectual rigor. In essence, scholarly exploration is characterized by arduousness, persistence, and trial-and-error. The instant, responsive nature of generative systems objectively fosters expectations for immediate gratification and a shortcut mentality in learning behaviors, diluting the time-consuming accumulation, repeated deliberation, and mindset of actively engaging with the indeterminate that are required for rigorous scholarship. If this ethical foundation is eroded, individuals cultivated through education may possess proficient technical application skills but lack the conceptual grounding and scholarly habits that support long-term academic development and innovative responsibility.

3.3 The Risk of Dilemma in Constructing University Students' Sense of Learning Agency

A fundamental purpose of education is to promote the development of human agency—that is, to help students form clear self-awareness, stable value judgments, and the metacognitive ability to actively steer their own learning and development trajectory. Cognitive autonomy is the concentrated embodiment of agency in the cognitive dimension. Generative AI, as a powerful external cognitive architecture, is creating new dilemmas in constructing a sense of learning agency among university students through its deep embedding into their learning processes.

The first manifestation of this dilemma is the misattribution of cognitive efficacy. When students efficiently complete tasks with the aid of AI and receive positive evaluations, the resulting sense of accomplishment is easily tied to the technical ability to manipulate and utilize a tool, rather than stemming from their own experience of deep understanding of knowledge, the honing of thinking quality, or the joy of creative contribution. This form of efficacy, dependent on an exogenous tool, is fragile and unstable. Once removed from the specific technological environment or confronted with ill-structured problems that the technology cannot directly resolve, underlying feelings of inadequacy and self-doubt can easily surface.

A second manifestation is the passive migration of value judgments. A sound sense of agency requires individuals to make independent judgments based on a self-formed value framework. Even if the output of generative AI appears neutral, it inherently embeds the cultural perspectives, value preferences, and even social biases present in its training data. Through frequent exposure to and reliance on this content, students' values and aesthetic standards can be subtly shaped unconsciously, rather than through an active, critical process of comparison, discernment, and choice. This passive migration of values weakens students' awareness and ability to construct an independent value system.

The most profound dilemma lies in the attenuation of the reflective self. The maturation of agency depends on a reflective self capable of continuously observing, evaluating, and adjusting one's own thoughts, motivations, and actions. The stronger the agency of the generative AI, the more it tends to encroach upon the psychological space and time an individual devotes to inward examination of their own thought processes, cognitive limitations, and learning motivations. When an external intelligent agent efficiently substitutes for a large volume of cognitive activities, the activity level and acuity of the reflective self decline due to lack of engagement. Students face the potential danger of devolving from conscious subjects actively constructing meaning into passive consumers of cognitive services within a technological consumerism paradigm. This dilemma in constructing a sense of agency touches upon the fundamental educational question of what kind of person we aim to cultivate, representing a deep-seated challenge educators must address in the era of technological empowerment.

4. Constructing Educational Response Pathways to Cultivate University Students' Critical Cognitive Autonomy

Confronted with the systemic reshaping of university students' cognitive autonomy by generative artificial intelligence and its concomitant educational risks, higher education must not remain at the level of passive technological adaptation or simple risk warnings. Instead, it must shift towards a proactive and constructive educational response. The core objective of this response is to cultivate students' ability to maintain and develop their critical cognitive autonomy within a technology-embedded cognitive ecology. Critical cognitive autonomy signifies that students can not only skillfully use technological tools but also maintain a clear awareness for scrutinizing them, independent judgment capabilities, and an ethics of responsible use, ultimately making technology a tool that strengthens rather than weakens their agentic power. Achieving this goal requires systematically promoting synergistic transformations in educational philosophy, teaching practices, and the role of teachers.

4.1 Renewal of Educational Philosophy: Establishing Objectives Shifted from Tool Application to Competency Development

The primary prerequisite for addressing the challenge of reshaping cognitive autonomy lies in a fundamental shift in the philosophy of higher education. The application of educational technology has often been guided by instrumental rationality, focusing on how to use new technologies to enhance the efficiency of knowledge transmission, enrich the forms of teaching presentation, or optimize management processes. If the integration of generative AI merely follows this path, it risks increasing its potential as a cognitive substitute, potentially trapping students in a dependency on outsourced thinking. A transition from a tool-application paradigm to a competency-development paradigm is imperative.

The core of this shift is to establish generative AI literacy and the underlying capacity for critical cognitive autonomy as one of the central objectives in higher education talent cultivation. The competency-development philosophy emphasizes that technology education is no longer just about operational skills but is fundamentally connected to human intellectual development and the construction of agency within complex technological environments. It requires viewing AI as a cultural and technological phenomenon that needs to be understood, critiqued, and mastered, not merely a ready-to-use tool. Educational objectives should explicitly incorporate the following dimensions: First, critical technology literacy, meaning students need to understand the basic working principles, data dependencies, and inherent limitations of generative AI, and be able to discern potential biases, errors, or logical gaps in its outputs. Second, cognitive meta-skills, which are the abilities to retain leadership in human-machine collaboration, including formulating precise prompts to guide AI, deeply evaluating and verifying AI-generated content, and integrating AI outputs into one's own independent thinking framework. Third, value and ethical judgment, the capacity for prudent reflection on the social impacts of technology application, the boundaries of academic integrity, and the division of responsibility between humans and machines. This philosophical renewal aligns with propositions that education should transcend instrumental rationality and uphold value rationality, and it meets the inherent requirements for cultivating high-quality learners in the intelligent era. Only by positioning critical cognitive autonomy as more important than instrumental efficiency in top-level goal planning can subsequent teaching reforms and evaluation changes have clear direction and a value anchor.

4.2 Reconstruction of Teaching Practice: Designing Deep Learning Scenarios Infused with Critical Dialogue

The renewal of teaching philosophy must be implemented through systematic reform of teaching practice. Traditional teaching methods centered on knowledge transmission are ill-equipped to handle the transformation of the cognitive environment triggered by generative AI. Inappropriate use of technology can even amplify risks. Cultivating the competency of critical cognitive autonomy requires instructional design to shift from providing answers to designing inquiry, from one-way transmission to multi-dimensional dialogue, constructing deep learning scenarios infused with critical dialogue. The core characteristics of such scenarios can be summarized as ill-structured, authentic, and reflective.

It is necessary to embed comprehensive inquiry projects into classroom tasks that are difficult for AI models to patternize. This task model

typically involves interdisciplinary knowledge integration, conflicts in stakeholder values, and authentic situations with incomplete or dynamically changing information. It guides students beyond basic information retrieval and synthesis to engage in a series of higher-order cognitive operations such as defining problems, proposing hypotheses, gathering and analyzing evidence, constructing arguments, and undergoing peer review.

Throughout this process, critical dialogue should serve as the main thread. The dialogue encompasses three levels: 1) Dialogue between the student and AI, which requires students to use critical questioning strategies to guide the AI and subject its responses to cross-verification and logical scrutiny. 2) Dialogue between students, and between students and teachers, debating AI-generated content, comparing results from different prompting strategies, and collectively analyzing their validity and limitations. 3) Students' reflective dialogue with themselves, involving metacognitive monitoring of the entire process of using AI for thinking, clarifying which parts relied on technology, what independent judgments they themselves made, and how responsibility is defined.

For instance, one can design research projects based on real-world social issues, requiring students to use AI assistance for literature review and data analysis, but simultaneously mandating the submission of a detailed "Technology Use and Critical Evaluation Report" explaining the AI's contribution, the process of verifying its outputs, and the student's own irreplaceable analysis and conclusions. This pedagogical reconstruction is, in essence, activity-centered. It integrates subject knowledge logic with the logic of students' cognitive development, deeply embedding technological tools into an inquiry process that emphasizes the combination of hands-on and minds-on engagement and the unity of questioning and construction. This enables students, while leveraging technology, to continuously train and strengthen their critical thinking and autonomous decision-making abilities—capabilities that cannot be replaced by technology.

4.3 Transformation of the Teacher's Role: Professional Development as Facilitators and Interpreters

The reconstruction of teaching practice places epoch-making demands on the role and capabilities of teachers. In the new cognitive landscape shaped by generative AI, the teacher's central role in knowledge transmission has partially diminished. However, this does not signify a weakening of the teacher's function but rather a deepening and transformation towards more essential and complex educational roles. Teachers must transition from being mere knowledge transmitters and instructors to becoming facilitators who promote the development of students' critical cognitive autonomy and interpreters of the technological-cognitive landscape.

As facilitators, the teacher's role transcends that of a simple knowledge provider. They design learning journeys that stimulate deep thinking and provide crucial scaffolding as students interact with vast amounts of information and powerful technological tools. This includes: guiding students to pose valuable questions rather than merely providing direct answers; cultivating students' ability to engage in structured, valuable dialogue with AI; and conducting formative assessments that examine students' thinking models, decision-making frameworks, and the quality of their dialectical refinement of intelligent outputs when using AI to achieve complex goals, rather than merely evaluating the final product.

As interpreters, teachers need higher-order professional competencies. They should be able to see beyond the technological surface to conduct in-depth analysis and provide reasonable guidance regarding the cognitive challenges, ethical considerations, and value conflicts arising from students' technological practices. Teachers need a deep understanding of the value implications of generative AI in teaching, must elucidate how the underlying logic of technology reshapes the pathways of knowledge production and dissemination, and must grasp the boundaries of intellectual division of labor and ethical responsibility in human-machine collaboration, translating this understanding into instructional design and classroom discourse. Teachers need to examine, together with students, the cultural and ideological tendencies within AI outputs, clarify the appropriate scope of AI use in academic work, and analyze the comparative strengths and weaknesses of human intuition, experiential judgment, and algorithmic outputs under various conditions.

This role transformation necessitates that universities systematically promote the professional development of teachers. Relevant training should not be limited to the level of tool operation but should deepen to encompass the philosophy of technology, educational ethics, and critical pedagogy deeply integrated with disciplinary teaching. Simultaneously, communities of practice for teachers should be established to share practical cases and strategies for cultivating students' critical cognitive autonomy within their respective disciplines. Together, they should explore how to re-anchor the teacher's irreplaceable value in educating people in an era of increasingly convenient knowledge access, focusing on igniting student wisdom, shaping good character, and guiding students to maintain the dignity of human thought and the freedom of their agency amidst technological change.

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