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From "Disciplinary Training" to "Cognitive Emancipation": Paradigm Shift and Path Reconstruction in Higher Education in the Age of Artificial Intelligence

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Abstract: Generative artificial intelligence is eroding the legitimacy of higher education's longstanding commitment to knowledge transmission. Yet much of the current discussion about AI in higher education remains confined to the language of "tool improvement" and fails to confront a more fundamental question: if AI can supply knowledge almost infinitely, on what grounds should universities continue to exist? This paper argues for a different approach—that the core mission of higher education should shift from "disciplinary training" to "cognitive emancipation." That is, universities should cultivate not individuals who have mastered a given body of knowledge, but "cognitive subjects" capable of critical thinking, problem definition, and cross-domain transfer. Such a shift requires systematic reconstruction across four dimensions: objectives, content, methods, and evaluation. Whether it succeeds ultimately depends on whether universities can uphold the bottom-line ethic of "making people human."

Keywords: Artificial intelligence; Higher education; Disciplinary training; Cognitive emancipation; Paradigm shift

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1. Introduction

The explosive development of generative artificial intelligence is reshaping the underlying logic of human knowledge production at an unprecedented pace. When a large language model can produce a structurally coherent academic paper in seconds, generate a logically rigorous literature review, or even propose hypotheses that researchers had not considered, the knowledge authority on which higher education rests is called into fundamental question [1].

In response to this transformation, current policy discussions and academic research display a pronounced instrumentalist orientation: AI is treated as a technical means to improve teaching efficiency, streamline administrative processes, and enrich instructional resources. This orientation is evident in the 2026

key research topics of China Higher Education Research, which include "research on the comprehensive empowerment of educational and teaching reform by artificial intelligence," [2] and in those of Fudan Education Forum, which include "educational transformation and governance in the era of generative artificial intelligence" [3]. Yet this narrative rests on an unexamined premise: that the existing goals and structure of higher education are stable, and that AI is merely a new tool in service of those goals.

This paper contends that this premise is precisely what must be questioned. The impact of AI on higher education is not merely instrumental but ontological. When the marginal cost of acquiring knowledge approaches zero, the legitimacy of universities whose core function is knowledge transmission can no longer be taken for granted. We must therefore ask a more fundamental question: in the age of AI, how should the functional positioning and existential form of higher education be redefined?

2. The historical formation of "disciplinary training" and its legitimacy crisis

2.1. Knowledge transmission as the core mission of higher education

The establishment of the modern university system is inseparable from the professionalization and institutionalization of knowledge. Since the University of Berlin articulated the principle of the "unity of teaching and research" in the nineteenth century, universities have gradually developed a system of knowledge production and transmission organized around disciplines. Within this system, "mastering knowledge" has been tacitly accepted as the primary goal of higher education, and disciplinary training has become the core mechanism for achieving it [4].

"Disciplinary training" here refers to the process by which individuals are shaped into qualified members of a specific disciplinary community through systematic curriculum design, standardized assessment, and hierarchical knowledge sequences. A qualified physics graduate is one who has mastered the basic principles and experimental methods of mechanics, thermodynamics, optics, and electromagnetism; a qualified master's graduate in history is one who is familiar with the sources and historiographical methods of a particular period. The efficiency logic of disciplinary training is clear: although the total stock of knowledge continues to grow, human capacity to learn is limited, and screening and structuring are therefore necessary to reduce the cost of learning.

2.2. The disintegration of disciplinary training by generative AI

The emergence of generative AI has fundamentally altered the constraint of "knowledge scarcity." When GPT-4 can pass most standardized examinations, when AI can map the scholarly landscape of a field in seconds, and when the value of "knowledge memorization" and "knowledge retrieval" depreciates sharply, disciplinary training centered on knowledge mastery loses its efficiency advantage.

The deeper problem is that AI can not only "master" knowledge but also "generate" it. This means that the university's monopoly on knowledge production is likewise challenged. If AI can discover patterns, propose hypotheses, and test conclusions faster than human researchers, then the university's function as a "knowledge production workshop" also requires redefinition[5].

The legitimacy crisis of disciplinary training thus emerges: when AI can accomplish knowledge transmission at lower cost, where lies the comparative advantage of universities whose reason for existence is precisely that transmission?

3. Cognitive emancipation: A paradigm reconstruction of the goals of higher education

3.1. From "What One Knows" to "Who One Can Become"

The reorientation of the goals of higher education requires a shift from a "knowledge logic" to a "subject logic" [6]. The core proposition of this shift is that the primary task of the university is not to enable students to master a particular body of knowledge but to help them become subjects with autonomous cognitive capacity.

The concept of "cognitive emancipation" is borrowed from the tradition of critical pedagogy [7], but it acquires new meaning in the age of AI. It entails, first, the ability to define problems—in an environment of information overload and proliferating AI-generated content, identifying genuinely meaningful questions is scarcer than solving them; second, the ability to exercise critical judgment—evaluating the assumptions, biases, and limitations of the "answers" AI provides; third, the ability to transfer across domains—migrating a cognitive mode from one field to another, a "creative leap" that AI currently finds difficult to achieve; and fourth, cognitive autonomy—not being governed by the "cognitive habits" shaped by algorithmic recommendation, filter bubbles, and AI-generated content.

3.2. The pedagogical implications of cognitive emancipation

The shift from disciplinary training to cognitive emancipation entails a fundamental inversion of pedagogical logic. Under the framework of disciplinary training, the curriculum is a "distribution system for knowledge," the teacher is a "mediator of knowledge," and evaluation is a "test of the degree of knowledge mastery." Under the framework of cognitive emancipation, by contrast, the curriculum is a "design for cognitive situations," the teacher is a "collaborator in cognitive processes," and evaluation is the "collection of evidence of cognitive capacity".

This inversion does not deny the value of knowledge learning but rather repositions it: knowledge is no longer the end but the "raw material" and "medium" of cognitive development. When a student studies physics, what matters is not remembering Newton's laws but understanding, through the cognitive style of physics, "how to construct a testable explanatory system"; when studying history, what matters is not memorizing dates and events but understanding "how to construct a meaningful narrative from fragmentary evidence."

4. Systematic reconstruction: Objectives, content, methods, and evaluation

4.1. Educational objectives: From "Professional" to "Cognitive Subject"

In current statements of educational objectives in higher education, "professional competence," "knowledge mastery," and "skill proficiency" occupy a dominant position. This objective system overlaps significantly with AI's capability structure and is therefore the part most susceptible to replacement. A cognitive-emancipation orientation, by contrast, would place "metacognitive ability," "critical thinking," "problem-definition ability," and "cognitive resilience" at the center.

This reorientation faces real tensions in practice: the labor market still screens talent primarily by signals of "professional competence." Universities must therefore seek a balance between "short-term employability" and "long-term cognitive development." One possible path is a "T-shaped" cognitive structure: maintaining necessary depth in one field (to sustain professional credibility) while cultivating cross-domain cognitive transfer (to cope with uncertainty) [8].

4.2. Curriculum content: From "System Transmission" to "Problem-Driven"

Curriculum design under the logic of disciplinary training follows the "logic of the knowledge system": foundations before specialization, theory before application, disciplines before integration. Curriculum design under the logic of cognitive emancipation should instead be organized around "problems" rather than "knowledge". A real problem—such as "how to address traffic congestion in a given city"—necessarily requires interdisciplinary cognitive engagement, necessarily involves judgment under incomplete information, and necessarily compels students to make decisions in a state of "insufficient knowledge."

Here AI plays the role not of "providing answers" but of "manufacturing cognitive friction": by presenting multiple possible solutions generated by AI, it forces students to evaluate, compare, and critique, thereby activating their cognitive subjectivity [9].

4.3. Teaching methods: From "Lecture–Reception" to "Design–Collaboration"

Lecturing was the most efficient mode of teaching in an era of knowledge scarcity [10], but in the age of AI its marginal returns are declining sharply. Teaching methods oriented toward cognitive emancipation require a shift in the teacher's role from "mediator of knowledge" to "collaborator in cognition."

Concrete forms of this shift include: AI as a "Socratic interlocutor"—students must learn to pose questions to AI and to identify the assumptions and limitations in its responses [11]; AI as a "cognitive adversary"—presenting arguments contrary to mainstream views, forcing students to defend their own judgments; and AI as a "feedback provider"—offering immediate feedback on writing, design, and other tasks, thereby freeing teachers' time for "cognitive guidance" rather than "grading".

4.4. Evaluation systems: From "Verification of Outcomes" to "Evidence of Process"

If the goal of cultivation is the "cognitive subject," then evaluation cannot consist solely of standardized examinations—the latter being precisely the core instrument of disciplinary training. The evaluation of cognitive capacity must rely on process-based evidence: the quality of students' questions, their critical records of AI outputs, practical cases of cross-domain transfer, and their trajectories of judgment in the face of uncertainty.

This shift is technically feasible: learning management systems can record data on students' cognitive processes, and AI can assist in analyzing patterns in that data. But the more fundamental challenge is institutional: when "measurable learning outcomes" become the core metric of accountability, goals such as "cognitive emancipation" that resist quantification tend to be marginalized [12].

5. What are universities for? The institutional ethics of the AI age

The foregoing discussion implies a more fundamental question: in an age when AI can "complete" most knowledge tasks, what is the reason for the university's existence as an institution [13]?

The functionalist answer—"universities cultivate the talent society needs"—faces a dilemma in the AI age, because "what society needs" is itself being reshaped by AI. This paper argues that the university's irreplaceability lies not in what it can do but in its status as an institutional space for "making people human" [14].

This means that the core mission of the university is not knowledge transmission, nor even capacity cultivation, but the provision of a form of growth experience that cannot be reduced to algorithmic processes—forming judgment through genuine interaction with others, building resilience through cognitive risk-taking

beyond one's comfort zone, and learning to think amid the anxiety of "not knowing the answer". AI can simulate dialogue, but it cannot replace the experience of "being taken seriously by another person"; AI can generate feedback, but it cannot replace the experience of "being recognized within a community" [15].

Thus higher education in the AI age is not a matter of "reshaping the university through technological logic" but of "reunderstanding the university through educational logic in the AI age." Technology is the means; human growth is the end. Upholding this bottom-line ethic is the last bulwark against the university's marginalization in the age of intelligence—and the most fundamental source of its institutional legitimacy.

Disclosure statement

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