AI in Higher Education: Addressing Challenges and Implementing Solutions

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Abstract: *In China, artificial intelligence (AI) technology is transforming higher education with unprecedented intensity and speed. Related research is continuously emerging, and investment funding is substantial. However, at present, multiple brands of AI platforms for teaching and examination coexist in universities. Moreover, these platforms exhibit "low-level interoperability alongside high barriers to integration," which further multiplies the workload of university faculty already facing significant role transitions, leaving them feeling overwhelmed. On the other hand, due to the use of AI, many noteworthy changes are occurring in teaching environments and students' learning processes. This paper elaborates on practical applications of AI in the field of higher education, analyzes the multidimensional role dilemmas faced by both faculty and students, and proposes solutions and measures. These include repositioning and reconstructing the roles of university faculty in the AI era, facilitating shifts toward role diversity, deepening teacher-student interaction and emotional connections, and cultivating comprehensive qualities adapted to the AI age.*

Keywords: *Artificial Intelligence (AI); university faculty; role dilemma*

Introduction

Enhancing the digital teaching capabilities of university faculty is a crucial issue in the field of education, as it relates to their professional development and the comprehensive implementation of the digital education strategy. In recent years, China has introduced several policy documents to promote the advancement of faculty digital teaching competencies, including the "Education Informatization 2.0 Action Plan," "China’ s Education Modernization 2035," and the "14th Five-Year Plan for Digital Economy Development." However, while Artificial Intelligence Generated Content (AIGC) technology actively contributes to improving the environment for developing faculty digital teaching capabilities, enhancing training outcomes, and fostering faculty self-directed learning-thus presenting new opportunities for advancing these competencies-it also introduces potential risks. These risks include concerns over the quality of generated content, integrity issues related to technological generation, infringement risks associated with generated materials, and challenges related to ethical norms and privacy protection.

2. Research Status

Current research on Artificial Intelligence (AI) abroad primarily concentrates on its core concepts, developmental stages, and technologies within specific domains, all of which have yielded substantial outcomes. In China, studies on AI span numerous fields such as education, teacher development, and ideological and political education, revealing two main tendencies. One tendency involves recognition, endorsement, and vigorous promotion, with the research focus placed on practical issues such as how to implement AI extensively and enhance its effectiveness. The other tendency examines various problems emerging from the integration of AI with higher education and teaching, including issues related to teachers' career development, challenges encountered in the teaching process, and diverse problems arising during students' learning.

Li Yuan's "Standardized Pathways for the Professional Development of University Faculty in the Context of Artificial Intelligence" (2025) argues that the professional development of university faculty is pivotal to advancing educational modernization. To address existing issues in current professional development-such as rigid teaching competency standards, biased research capability assessments,

outdated disciplinary knowledge criteria, and ambiguous information literacy requirements-it is necessary to implement strategies including establishing an intelligent teaching competency evaluation system, constructing a diversified research capability assessment mechanism, developing a disciplinary knowledge monitoring system, and formulating tiered information literacy indicators.

Zhu Hongtao et al., in their study "Research on Strategies for Enhancing University Faculty Teaching Capacity in the Context of Artificial Intelligence" (2025), argue that university faculty must undergo a transformation in teaching capacity amid the advancement of artificial intelligence. Achieving this transformation requires measures such as strengthening top-level design, establishing and improving relevant mechanisms, and creating a conducive smart teaching environment. In their article "The Impact of Generative Artificial Intelligence on University Faculty: Opportunities and Challenges" (2023), Zhao Xiaojuan and Xiang Minsheng posit that generative artificial intelligence offers opportunities for university faculty, including improving the efficiency of teaching resource utilization, enhancing research support, and enabling personalized learning guidance, thereby contributing to the enhancement of educational quality and student development. However, generative artificial intelligence also brings about role conflicts, capability crises, and issues. Examples include the shift of teachers from knowledge transmitters to facilitators, the pressure to adapt to digital technologies, and risks related to privacy protection and content security. Grounded in a cultural perspective, the authors advocate for fostering a "technology-inclusive culture," cultivating new skills among faculty, and implementing measures to ensure data privacy and content security in order to address these challenges.

Based on the above discussion, it can be concluded that the vast majority of current research predominantly focuses on the application issues of artificial intelligence, with a significant portion also concentrating on ideological and political education within the curriculum, as well as teaching and teachers' professional development. Rarely do studies take a broader view to examine various "dilemmas" introduced by artificial intelligence in the field of education, such as the "enhancement of workplace competencies" required by teachers themselves, the "transformational development" needed for their own growth, or the "identity crisis" arising from the shift from traditional roles to new ones. These issues are seldom proposed as dedicated, specialized, or long-term research topics. On the other hand, a similar situation exists regarding research on student learning. A characteristic of current studies is the relative scarcity of research closely related to students themselves-such as their "conceptions of learning," "cognitive patterns," "behavioral models," and "motivation"-in the context of applying artificial intelligence within higher education teaching scenarios. It can be said that there is a lack of humanistic concern, vigilance, and critical thinking in this area.

What does artificial intelligence truly signify for traditional education? Issues such as whether artificial intelligence can indeed replace teachers in the educational field, and the pros and cons it presents for students-matters pertaining to ethics-have been scarcely studied. Research on the impact and role of artificial intelligence in education, its effects on teachers' instruction, professional development, research, and growth, as well as on students' learning (including learning models and habits), cognitive development, and the construction patterns of knowledge and skills in an artificial intelligence environment, remains limited. Similarly, there is a scarcity of medical research (such as in brain science and neurology) on artificial intelligence-assisted human learning, alongside studies in the anthropology of artificial intelligence and sociological research related to artificial intelligence. The aforementioned areas of inquiry may require many more years to develop, yet they are highly necessary. Reflective research, which involves reviewing the research process and continuously deepening the understanding of the subjects studied, is crucial because it enables a re-examination of the entire procedure. On the other hand, it also represents a type of inquiry that can uncover issues overlooked amidst vigorous research activities, serving as a process to correct the course and directly relate to new innovations and inventions.

The artificial intelligence referred to here includes platforms such as Chaoxing, Weizhujiao, Zhihuishu, DeepSeek, Doubao, ERNIE Bot, and Kimi. The use of artificial intelligence in higher education institutions refers to its application in teacher-related tasks, such as generating courseware, lesson plans, and exam questions, grading papers, and compiling exam scores. A "dual-track" phenomenon has emerged among university students: while the use of ChatGPT is restricted, domestic or localized tools like ERNIE Bot, WPS AI, and DeepSeek have surpassed it in usage, becoming the de facto mainstream choices. In their daily academic inquiries and data integration, university students primarily use ERNIE Bot and DeepSeek. For tasks such as paper polishing and foreign language translation, they employ writing and translation tools like WPS AI. For experimental data processing and generating data and charts in presentations, they utilize software such as Python assistants and

WPS AI spreadsheets.

3. Changes in the Field of Higher Education Against the Background of Artificial Intelligence

Currently, China has entered the era of artificial intelligence. The entire society is discussing AI, and whether it will fade away one day after persisting for many years like the real estate bubble remains unknown at present. Artificial intelligence (AI) has emerged as a powerful software following QQ and WeChat. Although the metaverse gained popularity in China for a period in previous years, it later fizzled out inconclusively. AI possesses a variety of functions, including office tasks, collaborative writing by multiple users, editing, polishing, translation, statistics, OCR, and framework formulation. When combined with QQ (though its usage has declined) and WeChat, it far surpasses previous communication tools and office software. This is likely a primary reason why artificial intelligence has been so warmly embraced in China.

3.1 Faculty

The convenience of artificial intelligence has gained very high recognition from the vast majority of the intellectual class in society, including university faculty. Regarding the use of AI, there is a growing number of undergraduates who rely on it for document processing, as well as faculty members who use AI for searching and mastering research information. The vigorous promotion of AI learning in higher education institutions has become a firm force driving curriculum development and educational reform. This compels university faculty to respond to the transformations of the era and exert tremendous effort to adapt to the practical demands of teaching. On the other hand, the quality of AI software introduced by universities is uneven. Some are riddled with flaws, requiring frequent manual corrections and continuous improvements, while others frequently make errors even in basic tasks such as statistics or content generation. This leads faculty to believe that "AI is too clumsy; it's better to compile statistics and write evaluation reports manually." Regardless, it is an undeniable fact that artificial intelligence has stirred significant waves within the academic circles of higher education today.

3.1.1 Academic Integrity

In the environment of AI application, issues concerning the academic integrity of university faculty present new challenges, which are mainly concentrated in two aspects, with real cases already having emerged. One is that AI has given rise to new forms of academic misconduct. AI tools can generate text with a single click that is difficult for traditional plagiarism detection systems to identify, providing new possibilities for academic misconduct. More critically, when faculty use AI to assist in research, they may inadvertently cite false academic literature generated by it. AI-assisted research and citation are highly likely to produce non-existent papers, works, or viewpoints, thereby damaging the reliability of reports and the credibility of institutions. Another challenge is the current dilemma of institutional response and definition faced by universities. Confronting these issues, universities are actively establishing systems to mitigate risks. For instance, recent guidelines issued by Tsinghua University explicitly prohibit the submission of AI-generated text, code, or other content-whether directly or after minor modifications-as academic work and emphasize the necessity of disclosing AI usage. The academic community is currently grappling with the difficulty of clearly distinguishing between "AI-assisted learning" and "AI-facilitated cheating in writing." This constitutes a highly noteworthy issue in AI-related research.

3.1.2 Classroom Teaching

The use of artificial intelligence in higher education has led to several significant changes. University faculty must transition from being knowledge transmitters to learning facilitators. This role shift itself may require substantial effort and time. Artificial intelligence possesses broader knowledge than the average instructor in many fields, particularly in purely theoretical domains. While students may achieve higher efficiency in knowledge acquisition by relying on AI, on the other hand, faculty supervision, evaluation, inspection, and monitoring hold greater potential to accelerate students' knowledge construction. Ultimately, the role should evolve from that of a student supervisor to a supporter of students' psychological and value-based growth in new domains, rather than becoming a burden on their mental and ethical development.

3.2 Students

At the instructional level, the coexistence of numerous AI tools has led to the highly widespread and scenarized adoption of artificial intelligence among students. Its utilization has reached an extremely high penetration rate, with AI becoming the primary channel for information access, surpassing traditional search engines and social media. Applications such as document and literature retrieval, translation, text polishing, and summarization for reporting have become thoroughly integrated. First- and second-year undergraduates primarily focus on using AI for "information retrieval, oral practice, knowledge acquisition, and mock interviews," while third- and fourth-year students employ it more for "career advice, data analysis, code writing, audio-video editing, and meeting minutes." This clearly demonstrates that artificial intelligence has become an indispensable "all-around partner" in learning, daily life, and social interaction. While this phenomenon significantly enhances learning efficiency and creativity, it also raises concerns regarding intellectual passivity. The latter is closely related to the holistic physical and mental development of learners.

Some studies suggest that the way humans receive information can alter their thinking patterns and even affect the physiological structure of the brain. As a significant driving force of innovation, generative artificial intelligence is profoundly reshaping the cognitive structures, behavioral characteristics, and thinking paradigms of university students. Cognitive structures include students' understanding and acceptance of knowledge itself, while behavioral characteristics encompass the shift away from independently seeking knowledge sources through manual and mental efforts. For example, behaviors such as utilizing libraries or teacher resources, reading printed books and newspapers, along with associated habits like reading practices, note-taking, card records, and the brain's patterns of knowledge absorption fall within this category. In terms of thinking paradigms, AI may influence students' high-level thinking, such as the ability to actively and flexibly deconstruct problems and seek solutions. Since its inception, artificial intelligence has created the impression of being omniscient, with algorithms surpassing human capabilities. Whether this perception stems from statements by scientists and researchers or from commercially driven advertisements, it has become widely accepted by the public, including university students. Information conveyed by such authoritative and dominant entities carries significant persuasive power. For instance, the notion that AI may replace certain job positions has generated an impact among the public and even within intellectual circles, potentially exacerbating feelings of "powerlessness" and "helplessness" in society and further fueling the "lying flat" phenomenon. On the other hand, a prevailing cognitive pattern in higher education is the tendency to "ask AI" in order to obtain the "most correct answer" and the "reassurance generated by AI." Of course, some university students also report that AI can lie and fabricate facts, arguing that it should not be applied in teaching.

4. Dilemmas Faced by Faculty, Students, and Teaching

The deep integration of artificial intelligence has triggered multi-dimensional and profound practical dilemmas in higher education. For faculty, the foremost challenge is the crisis of role identity and competency transformation. The traditional role of knowledge authority is being challenged, requiring teachers to shift toward becoming learning facilitators and growth partners. However, the lack of systematic support and clear pathways for this transformation leads to intense professional anxiety and self-doubt in instructional design and classroom interaction. Simultaneously, the gap between technology application and teaching effectiveness is becoming increasingly pronounced. Although high expectations are placed on artificial intelligence, the quality of its generated content is uneven, and logical fallacies occur frequently. Consequently, faculty must invest additional effort in correction and revision, creating a paradox of "technology adding burden" rather than "technology enabling empowerment." Furthermore, the academic integrity oversight system is under pressure to be restructured. Assignments and papers generated by AI are difficult to effectively distinguish, rendering traditional academic misconduct detection methods nearly obsolete. Establishing credible evaluation mechanisms in this new environment remains an unresolved challenge.

For students, the dilemma is primarily manifested as a potential crisis in cognitive development and learning autonomy. Excessive reliance on AI for tasks such as information retrieval, text polishing, and problem-solving may lead to the weakening of critical thinking and the degradation of deep learning abilities. When "asking AI" becomes the first instinct for resolving issues, students' cognitive habits of active exploration and systematic reasoning face the risk of being undermined. While the "standard answers" provided by AI are convenient, they also invisibly construct cognitive constraints,

suppressing divergent thinking and innovation. Simultaneously, issues such as information cocoons and the narrowing of skills cannot be ignored. AI tends to push content based on user preferences, which can homogenize students' knowledge structures, while outsourcing core skills like writing and data analysis to machines may lead to a substantive decline in their foundational competencies.

At the holistic teaching level, the dilemma manifests as a mismatch between traditional teaching models and the AI ecosystem. The existing curriculum systems, evaluation standards, and teaching methodologies are largely built upon the knowledge transmission logic of the industrial age, making them difficult to adapt to the demands of the AI era for higher-order thinking, human-machine collaboration, and innovation literacy. The teaching evaluation system vacillates between efficiency and depth: on one hand, it encourages the use of AI to enhance efficiency, while on the other hand, it worries about its potential erosion of learning depth, resulting in a dilemma. Furthermore, educational equity faces new challenges. Factors such as access to AI tools, proficiency in their use, and the ability to afford paid features may all exacerbate the digital divide among students from different backgrounds, leading to new inequities in the distribution of educational resources.

5. Enhancement Strategies

To address the aforementioned dilemmas, universities need to construct a systematic enhancement strategy that involves multi-stakeholder collaboration and advancement across multiple levels.

At the faculty development level, a tiered and targeted empowerment system should be implemented. Firstly, it is essential to conduct artificial intelligence literacy training that spans entire careers. The content must go beyond tool operation to deeply integrate AI ethics, human-machine collaborative instructional design, and the critical evaluation of generated content. Secondly, the boundaries and norms for AI application in teaching must be clearly defined by establishing explicit classroom AI usage guidelines, thereby balancing technological convenience with academic integrity. Furthermore, active efforts should be made to reshape the role of faculty, encouraging their transition from knowledge transmitters to designers of learning contexts, guides for cognitive development, and enablers of student growth. Corresponding incentive and recognition mechanisms should also be established.

At the student cultivation level, the core of the strategy lies in strengthening agency and critical thinking. The curriculum system must deeply integrate artificial intelligence literacy education to cultivate students' ability to engage in efficient and critical dialogue with AI, enabling them to become masters of the tool rather than its dependents. Teaching evaluation methods should be vigorously reformed by reducing the assessment of standardized, memorization-based knowledge and increasing the proportion of project-based learning, open-ended projects, and human-machine collaborative tasks. The focus should be on evaluating students' inquiry processes, innovative thinking, and problem-solving abilities. Simultaneously, academic norms and ethics education must be strengthened by clearly informing students of the appropriate scope of AI use and the consequences of its misuse, thereby fortifying the defenses of academic integrity.

At the level of teaching system reconstruction, universities need to undertake top-level design and ecological cultivation. The primary task is to revise talent cultivation plans and course syllabi, explicitly defining human-machine collaboration capabilities, critical thinking, and innovation literacy as core educational objectives. Secondly, significant investment should be directed towards research and development of reliable AI teaching platforms and tools adapted to local needs, thereby lowering the barrier to application and reducing technological anxiety among faculty. Simultaneously, active exploration and establishment of a new intelligent evaluation system based on processual data and diverse evidence are necessary to achieve comprehensive and dynamic assessment of learning outcomes. Finally, efforts should focus on fostering a campus culture characterized by "technological inclusiveness guided by humanistic principles," ensuring that while embracing technological innovation, the fundamental educational mission of nurturing individuals is steadfastly maintained, and that artificial intelligence genuinely serves the holistic development of both faculty and students, as well as the continuous enhancement of education quality.

Conclusion

Geoffrey Hinton, a Turing Award laureate often referred to as a founding figure of modern artificial intelligence, discussed the possibility of silicon-based life potentially replacing carbon-based life at the

2025 World Artificial Intelligence Conference (WAIC). Regardless, artificial intelligence has created significant waves worldwide, playing an epoch-making role in the dissemination of knowledge and skills and in solving numerous research problems. China has also joined the global effort in popularizing, researching, and developing artificial intelligence, and higher education has, as a matter of course, been substantially affected. While attention and investment in the promotion and positive research of AI are immense, studies focusing on the challenges arising during its implementation-concerning teachers, students, and the teaching process itself-remain exceedingly scarce. This paper calls for vigilant critical thinking and humanistic concern throughout the process of promoting artificial intelligence.

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