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COMMENTARY

AI's Restructuring of the Fundamental Knowledge-Imparting Function of Education

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Abstract Amid the rapid development of artificial intelligence (AI), this paper underscores the historical inevitability of exploring long-term development trends in education and emphasizes AI's growing influence in this field. It is anticipated that AI will become the leading force in education in the future, and for this reason, human teachers may be required to seek a path of symbiosis with AI. Enlightened by *Opinions on deepening the implementation of the "AI Plus" initiative* issued by the State Council of the People's Republic of China (2025), this paper explores the inevitability of human society's continued development of AI and the synchronization between China's digital education transformation and building China into a leading country in education. Mainly, the paper analyzes AI's impact on the underlying logic of education: Driven by intellectual curiosity, students can complete the learning process from building knowledge from scratch to profound understanding through continuous interactions with AI, which in turn, leads to AI gradually replacing education's knowledge imparting function. Consequently, this change may weaken the primacy of competency development in the long run, leading to substantive alterations in multiple dimensions of the traditional educational model. This paper clarifies the analytical logical framework covering four key dimensions—from the micro to the macro levels—proposed in *White paper on China's smart education* (Ministry of Education of the People's Republic of China, 2025), namely future teachers, future classrooms, future schools, and future learning centers, laying a theoretical foundation and ultimately providing an overarching framework to guide the subsequent research of the relevant field.

Keywords restructuring, knowledge-imparting, future education, AI's influence

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1 Historical Inevitability of AI Development and the Long-Term Trends of Educational Reform

Education is a societal issue of great importance. Against the backdrop of the unprecedented changes that we have witnessed in the 21st century, especially with the rapid iteration and development of artificial intelligence (AI), tremendous changes are expected to occur in various fields. Education, in particular, will be fundamentally affected by the AI revolution. This paper centers on the development of AI in recent years, the analysis and interpretation of its far-reaching impacts on all links of education, and the author's own reflections, serving as the opening chapter of a series of commentaries on this topic. Specifically, it focuses on how AI restructures the fundamental logic of education, which lays a solid foundation for the in-depth exploration under the "Four Futures" framework proposed by Ministry of Education of the People's Republic of China (2025), including future teachers, future classrooms, future schools, and future learning centers.

Before delving into detailed discussions, we first emphasize the importance of exploring the long-term development trend of the current education sector. Nowadays, society is experiencing involution. Teachers engaged in education are worn out by endless daily trivialities and miscellaneous non-teaching duties, leaving them no time to focus on the long-term development trend of education. Although AI—the main focus of this paper—was initiated as early as the 1950s, its growing impact on education has only been observed in recent years. Much like a massive object in Newtonian mechanics accelerates steadily under the action of a constant force, it maintains a low velocity in the initial stage yet accumulates substantial overall momentum.

Today, AI-enabled education and teaching have become mainstream in the education sector, and

teachers' main responsibilities have been more or less affected by AI. However, many teachers, even the young ones, still follow past inertia, keeping their heads down and plodding along without reflecting on the long-term impact of AI on their professions, nor can they map out long-term development paths based on the possible educational forms in the AI era. If the situation continues, the fundamental impacts of the AI upsurge on the future trends and prospects of human society and education will follow one after another, and teachers are likely to be phased out in the future.

At present, we are still in the stage where AI is empowering education, with human teachers occupying a primary position in this dynamic. However, in the long run, with continuous breakthroughs in AI, this dominant status will eventually be reversed, as AI will become the leading force in education. Thus, human teachers must be able to adapt to this trend in advance and seek a path of symbiosis with AI teachers, rather than clinging to their current dominant position.

To avoid or at least delay such a situation in the future, it is imperative to determine clear goals for current and future efforts and to make investments in critical areas in response to the predicted long-term trends in education. To achieve these goals, there is a need to first identify the areas where significant efforts are needed and where perfunctory ones will suffice. A popular view nowadays holds that in the future, those who can use AI will defeat those who cannot; those who use AI proficiently will defeat those who use it poorly; and those who apply AI in the right fields will defeat those who apply it in the wrong ones. While initially believing this view, after undergoing in-depth reflections, the author now holds the belief that even those who can use AI may not be immune to elimination, and those who cannot use AI may not necessarily be eliminated. The core idea lies in what kind of work one does and how one accomplishes it, and this will be explained in detail in the subsequent series of articles.

Geoffrey Hinton, winner of the 2024 Nobel Prize in Physics, illustrated the current and future development of AI in the keynote speech of the 2025 World Artificial Intelligence Conference and the High-Level Meeting on Global AI Governance entitled "Will digital intelligence replace biological intelligence?". Hinton (2025) describes the current situation of human beings as follows: When you own a tiger cub as a pet, it is cute while it is young, but when it grows up, it can easily kill you if it wants to. To survive, you have only two options. You should either get rid of the tiger cub, or find a way to ensure that it can never kill you.

An analysis of the two paths for humanity's future reveals that the first path is actually unattainable. This is because, in the context of acute inter-bloc confrontation and conflicts in modern society, any party that abandons the support and development of AI will be easily defeated and forced to surrender by parties empowered by AI, via dimensionality-reduction strikes. Thus, there is no realistic possibility or scenario in which human society can eliminate this "tiger cub". Therefore, humans have to choose the second path, which is fraught with great uncertainty. Furthermore, it is impossible to predict whether we can truly find a way to ensure that the tiger cub never wants to kill you when it grows up. In a sense, Pandora's box has long been wide open, and human beings are already on this irreversible path, where digital intelligence will eventually replace biological intelligence.

To further advance the development of AI, the State Council of the People's Republic of China (2025) issued *Opinions on deepening the implementation of the "AI Plus" initiative* (hereafter referred to as "*the Opinions*") on August 26, 2025. According to *the Opinions*, by 2027, China will take the lead in realizing extensive and in-depth integration of AI within six areas, namely, science and technology, industrial development, consumption upgrading, people's well-being, governance capabilities, and global cooperation, with the penetration rate of new-generation intelligent terminals and systems exceeding 70%. By 2030, AI will fully empower China's high-quality development, with a high-level penetration rate of new-generation intelligent terminals and systems exceeding 90%. By 2035, China aims to enter a new era of intelligent economic and social development with the support of AI. This timetable is synchronized with *The 2024–2035 master plan on building China into a leading country in education* (Central Committee of the Communist Party of China & the State Council of the People's Republic of China, 2025), suggesting that the main theme and core of China's advancement toward being a leading country in education is to realize intelligentization, which also places an urgent demand for systemic reforms across the education sector.

2 AI's Impact on the Underlying Logic of Education: Restructuring of Knowledge-Imparting Function

Based on the global expectations and official layouts for AI development mentioned above, a closer examination of its impact on education reveals an underlying logic. Conversational AI tools refer to AI systems (e.g., DeepSeek, Doubao, and ChatGPT) that are endowed with the capabilities of natural language interaction, logical reasoning, and knowledge updating. These systems can realize real-time question-and-answer sessions and in-depth discussions with human learners, thus providing robust support for autonomous learning. With the continuous upgrading and evolution

of conversational AI tools, along with the steady improvement of AI's reasoning capabilities, students' learning can gradually become independent of traditional teaching materials, regardless of courses, school stages, grades, and majors, and even independent of human teachers and schools. Driven by curiosity, students can start from asking questions about a certain issue and keep probing further, proceeding step by step from scratch to profound understanding with the assistance of AI, until they become experts in the field and develop a lifelong interest in it. Here, "probing further" refers to the process of asking extended and exploratory questions to AI on a specific issue, with a view to gaining a deeper understanding of the essence of the issue, which is a core competency for self-directed learning in the AI era.

The AI-empowered learning process, from ignorance to profound understanding, breaks away from various links and structures relied on by traditional teaching models. More importantly, the former can achieve or even surpass the educational results pursued by traditional teaching. In this sense, the responsibility of education to impart knowledge and skills will gradually be replaced by AI. This process involves two aspects. First, the knowledge and skills students learn from traditional education are no longer as essential to society as before, as societal contributions of human beings with professional knowledge and skills might eventually be outweighed by those of AI robots. Therefore, the driving force for creating social wealth and promoting social progress will gradually shift from human beings possessing scientific and technological knowledge and capabilities to individual proficiency in deploying AI. Second, even the process of imparting knowledge and cultivating skills will no longer be implemented by human teachers; in the future, AI instructors can replace humans in performing teaching activities with even greater efficiency. The responsibility of education to impart knowledge and cultivate skills will undergo fundamental, step-by-step changes. At present, the former is already being rapidly replaced by AI, while the latter has not yet been directly replaced by conversational AI tools. However, as AI gradually becomes the core subject of social wealth creation and social development in the future, the value of human abilities to society may be greatly reduced. Future education may not lay such great emphasis on ability cultivation as it does at present. At the current stage, before AI surpasses human beings, ability cultivation is still an important content of education and a key support for promoting social development, but it will eventually move to a less important position in the long run. Therefore, the modern education and teaching model formed by human society over thousands of years, including books and teaching materials, curricula, school stages and grades, academic majors, human teachers and schools, will undergo qualitative changes or even radical restructuring.

3 Evolutionary Logic of the "Four Futures"

This paper adopts the "Four Futures" framework put forward by the Ministry of Education of the People's Republic of China at the 2025 World Digital Education Conference to lay a theoretical foundation for follow-up research. Centered on the underlying logic of how AI restructures the knowledge transmission function of education, the subsequent research will conform to the inherent evolutionary laws of the education system.

The modern educational system is structured based on an underlying logic that progresses from the micro to the macro and from the individual to the whole. Here, teachers, classrooms, and schools are the irreducible core elements of modern education. From the smallest to the largest and from the partial to the whole, these three elements jointly support the operational framework of the entire educational system. Within this framework, teachers are the core implementers of educational activities and the key link connecting knowledge and students; classrooms are the core micro-scenarios of education and teaching, as well as the direct carriers of knowledge transmission and interactive inquiries; and schools are the organizational forms and macro-carriers of education, integrating various elements, such as teachers, classrooms, and resources, while also embodying the educational system in a concrete form.

The subversive transformation of education by AI is not a partial change in a single link but a fundamental restructuring of this entire system, and such restructuring is bound to start with the transformation of these core elements. Therefore, to explore the future development trends of education in the AI era, it is essential to conduct an in-depth analysis of the evolutionary forms of these three elements (teachers, classrooms, and schools). A fundamental change in any of the three will trigger a chain reaction in the entire education system, and only by clarifying the future forms and development paths of these elements can we grasp the core thread of the educational system's complete transformation.

Future learning centers, on the other hand, are the ultimate entities formed by the integrated evolution of all core elements of the education system after the full development of artificial intelligence. After AI's all-round restructuring of teachers, classrooms, and schools, the stage boundaries, institutional barriers and temporal and spatial restrictions of traditional

education will be completely broken. The diverse roles of teachers, the intelligent forms of classrooms and the value realization functions of schools will continue to integrate and permeate, eventually converging to form future learning centers that integrate all educational elements. It is not a negation of teachers, classrooms, and schools, but an upgrade and integration of the three in the AI era, an ultimate embodiment of education moving from "stage-based, standardized and bounded" to "lifelong, personalized and unbounded", and also the core carrier for building China into a leading country in education.

Based on the above discussion, the follow-up research will proceed in a progressive order—from the micro to the macro, from the partial to the whole, and from the basic elements to the ultimate entity. Specifically, against the backdrop of AI development in education, the subsequent research will discuss the cultivation of future teachers, focusing on the role evolution and development paths of education implementers; explore the building of future classrooms, focusing on the model innovation and practical implementation of future education and teaching micro-scenarios; look into the creation of future schools, focusing on the transformation and value restructuring of organizational forms of education; examine the establishment of future learning centers, focusing on the ultimate carrier and development paths of the integrated evolution of China's educational system. This order is not only in line with the structural logic of the education system, but also conforms to the law of AI restructuring education, aiming to analyze the future forms of education in the AI era layer by layer and from the surface to the depth. It is worth noting that centered on teachers' perspectives, the subsequent research will integrate relevant research findings and practical experience, explore the specific forms and evolutionary paths of each dimension in depth, and thereby offer insights and references for the future professional development of school teachers.

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