Artificial Intelligence Leads the Digital Innovation and Development of Higher Education

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Abstract: In recent years, the tremendous potential contained in digital technology has been fully realized. The progress of artificial intelligence technology has brought new opportunities and challenges for reshaping the form of education and promoting the innovative development. With the continuous and thorough implementation of the strategy of education digitalization, higher education urgently needs to undergo profound changes in areas such as educational philosophy, school-running paths, teaching models, learning paradigms, evaluation in order to shape a new ecosystem of Intelligence Plus higher education.

Key words: Artificial intelligence； Digitization of education； New ecology of higher education

The digitalization of education is an inevitable choice to actively adapt to the new round of scientific and technological revolution and industrial transformation, an inevitable requirement for promoting higher quality educational equity, an inevitable trend in the stage of education popularization, and the only way to drive the innovative development of education. The Communist Party of China Central Committee taking

Comrade Xi Jinping as the core attaches great importance to the digitalization of education. The 20th National Congress of CPC proposed for the first time to promote the digitalization of education and build a learning-oriented society and major country with lifelong learning of all people. In 2023, General Secretary Xi Jinping stressed at the fifth group study session of the Political Bureau of the CPC Central Committee that digitalization of education is a crucial breakthrough for China to open up new avenues of education development and shape new advantages in this field. General Secretary Xi Jinping's series of speeches and important instructions provide essential guideline for the digitalization of education and indicate the direction of future development.

In recent years, the Ministry of Education has thoroughly implemented the strategic deployment of the CPC Central Committee, steadily promote the strategic action of digitalization of education. Adhering to the principles of application-oriented， service-oriented, concise and efficient, and safe operation， as well as the concepts of connection first, content-based and cooperation essential. The Ministry of Education has integrated typical resources, content into a coherent whole. This has released the amplification, superposition, multiplication and continuous spillover effect of digital technology on the high-quality development of education. Consequently, the ministry has achieved the transformation from scarcity to abundance, from small-scale learning to large-scale application, and from low to high levels of utilization. Remarkable achievements have been made in improving the quality of education, promoting the learning revolution, and addressing the challenges of the pandemic, exploring a path of digitization development with Chinese characteristics.

Digitalization drives the high-quality development of higher education In recent years, the Ministry of Education has adhered to the construction concept of government leadership， school-based implementation and social participation ,continuously promoting the construction utilization of online education resources such as MOOCs. The vigorous development of MOOCs and online education in China is profoundly changing the form of students' learning, teachers' teaching, school management and the form of education. China has established the world's largest online curriculum system. Up to now, the number of MOOCs launched in China has exceeds 76,800, with 454 million registered users and 1.277 billion students. Additionally, 415 million student credits have been recognized through MOOCs. In 2022, the Ministry of Education, relying on the high -quality class resources, launched the construction of the National Higher Education Smart Education Platform, also known as Smart Higher Education Platform. It gathers 27,000 high-quality MOOCs courses from top universities at home and abroad, as well as 65,000 various types of resources including textbooks, experiments, research and teaching materials, covering all disciplines and majors in higher education. It has become the world's largest and most comprehensive national open platform with the largest number of users worldwide. In recent years, the Ministry of Education has launched and implemented Double Ten Thousand Plan for Top Undergraduate Courses, recognizing a total of 2,968 national-level online top courses, 2667 blended courses combing online and offline teaching and 1,200 virtual simulations experiment al teaching courses in two batches. Significant achievements have been made in promoting digital technology applied in education teaching, as well as in promoting and sharing high quality resources.

This has sparked a far-reaching revolution in the classroom. The new form of courses represented by MOOC has overturned the traditional university classrooms. A large number of teachers have devoted themselves into the exploration and practice of MOOCs and online education, resulting in the vivid practice of diverse teaching methods, such as cross-university and cross-regional online teaching, 1 (class) + M (school) + N (student) collaborative teaching, online-offline blended teaching, MOOC + SPOC + flipped classrooms. To promote the sharing and innovative application of high-quality educational resources in on a larger scale and support the revitalization of higher education in the central and western regions, the Ministry of Education has thoroughly implemented the MOOCs Western Region Plan. By using digital technology, teachers and students from universities in the eastern and western regions can jointly conduct teaching and research, teach and learn together, exploring a road of win-win cooperation between universities in the eastern and western. Up to now, it has provided 198,400 MOOCs and customized courses to western universities, with 5.0694 million blended courses, and 536 million students participating in learning.

A new platform for international cooperation and exchange in online education has been established. In 2020, China took the lead in establishing the "World MOOCs and Online Education Alliance" (hereinafter referred to as the Alliance). This is the first multilateral international organization in the field of higher education digitalization initiated and led by China. Its members include 17 well-known universities from 16 countries, as well as 6 online education institutions. Since 2020, the World MOOCs and Online Education Conference have been held annually, and the Beijing Declaration on the Development of MOOCs has been issued. In 2023, the 2023 World MOOCs and

Online Education Conference was held in Milan, Italy, for the first time, attracting wide attention both at home and abroad. Relying on the alliance, Chinese universities have cumulatively offered 341 globally integrated courses and launched 10 globally integrated certificate programs, attracting nearly 25.4 million learners; 88 renowned Chinese universities have provided nearly 300 high-level in English (or with English subtitles) MOOCs to Indonesia, supporting online learning for 3000 Indonesian universities; focusing on significant issues of common concern of humanity, a series of global open courses have been launched, and international conferences, academic conferences and nearly a thousand live broadcasts have been held. With the continuous deepening of international exchanges in online education, the "circle of friends" of Chinese higher education is constantly expanding, and its international influence, appeal and shaping power are constantly improving.

Introduce more forward-looking and influential theoretical results. China has taken the lead in organizing experts and scholars from global universities, industries, international organizations and governments to develop and release the Infinite Possibilities: Report on Digital Development of World Higher Education (hereinafter referred to as the Development Report) and the Index of Digital Development of World Higher Education (hereinafter referred to as the Development Index) for two consecutive years. On the basis of a comprehensive and systematic review of the current situation of the global digitalization development, the Development Report puts forward trends, changes and challenges of the digitalization development of world higher education, and creatively proposes the three-stage theory of "transformation-transition-wisdom" for the digitalization development of education. The Development Index puts forward four

primary indicators including digital education, digital school running, digital management and digital security, as well as 10 secondary indicators and 18 specific measurement indicators. It gathers authoritative data from more than 300 world-renowned universities and publishes the measurement results of the digital development of higher education in 47 countries. The publication of the Development Report and Development Index has important reference value for accurately analyzing and predicting the overall situation of world higher education and guiding countries around the world to formulate strategies for the digitalization development of higher education.

Changes and Constants of higher education under the background of artificial intelligence In the 21st century, information technologies such as the Internet, big data, cloud computing have developed rapidly. Especially since 2022, major breakthroughs have been made in artificial intelligence technology. The generative artificial intelligence represented by ChatGPT has been born suddenly. The powerful ability of artificial intelligence to automatically generate content has attracted wide attention. Generative artificial intelligence technology refers to models and related technologies with text, picture, audio, video and other content generation capabilities, which are currently rapidly influencing or even reshaping many industries, including education. In 2024, OpenAI launched a Sora model which creates videos based on text instructions, making a huge leap forward in using AI to simulate the real world.

Artificial intelligence, characterized by a high degree of integration of technological attributes and social attributes, serves as a new engine of economic development and an accelerator of social development. Throughout the history of education， it can be seen that technology and education has grown together ， and every scientific and

technological revolution and industrial transformation has brought leapfrog development to education. In recent years, the huge potential of digital technology is being fully released, especially the progress of artificial intelligence technology, which has brought new opportunities and challenges to reshaping the form of education and promoting in the field of higher education, supporting the innovation of talent cultivating models reforming teaching methods, enhancing the capability of education management, building an intelligent, networked, personalized, lifelong education system are important means to promote balanced development of education, promote education fairness, improve the quality of education. In the digital era, what the role of education should be has become a proposition of all countries around the world. In this context, it is necessary to face the opportunities and challenges brought by artificial intelligence, and re-examine the work of training of higher education talents from the perspective of adapting to the needs of the future era.

From the perspective of the fundamental task of personnel training, the 20th National congress of the CPC proposed to adhere to educating talents for the Party and the country, comprehensively improve the quality of independent talent training, and strive to cultivate top-notch innovative talents to gather the talents all over the world to make use of them." No matter what period it is and what way of education is adopted, the original aspiration and mission of education remain the same. Empowering higher education with artificial intelligence must focus on the fundamental task of cultivating morality and fostering talents, integrating the education of socialist core values into the entire process and every aspect of talent cultivation, and cultivating socialist builders and

successors with comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor.

From the perspective of talent training structure, the training goal of talents should keep pace with The Times and cultivate talents to meet the needs of the future social development. With the emergence of ChatGPT, a large number of traditional positions are facing transformation or being replaced, and while a large wave of emerging occupations based on "artificial intelligence + X" will arise. The new demands of society have put forward higher requirements for the adjustment of disciplines and majors. Higher education must plan in advance, actively adapt to and lead the needs of economic and social development, constantly improve the adaptability between talent training and social needs, and serve the national strategy and regional economic and social development.

From the perspective of talent training models, artificial intelligence will bring dramatic changes or even disruptive transformations, to the educational philosophy, content, scenes, methods and evaluation. From the perspective of teaching, the traditional classroom knowledge will transform to the deep interaction of "teachers, students and machines" and to cultivating ability and innovative literacy. From the perspective of learning, personalized learning will be realized with students as the center. At the same time, artificial intelligence is transforming from "a tool" to "a partner", and gradually forming a relationship of mutual promotion and mutual association. Human-machine collaboration and cross-boundary integration will become the inevitable development of the times.

At the same time, we should also be soberly aware that technology has "two sides", and artificial intelligence is no exception. Ensuring safety, credibility and reliability is the common value pursuit of the development of AI, and it is also a problem that must be faced when it is integrated into education era. At present, in addition to the problems that the content generated by artificial intelligence technology is not rigorous or even difficult to distinguish between true and false, some scholars have also proposed the marginalization of teachers' status, the "island" of students' learning, the fragmentation of knowledge system, the risk of privacy leakage, and the gap in digital application. Therefore, it is necessary to adhere to the concept of "people-oriented", uphold the tenet of "digital for good", pay attention to artificial intelligence to the social, economic, political, cultural, moral, influence and impact, clarify the application boundaries of artificial intelligence in daily teaching, scientific research, social service, and management of data, avoid ethical and safety risks, establish industrial standards, technical standards, governance standards, and ethical norms for the application of artificial intelligence in education, and coordinate the promotion of digital education, digital technology, digital humanities, and digital ethics to create a favorable environment for the development of artificial intelligence.

Shaping a new ecology of "artificial intelligence +" higher education Facing the further promotion of strategic action for digitalization in education, higher education urgently needs to carry out profound changes in the aspects such as educational philosophy, school-running paths, teaching models, learning paradigms, evaluation methods a to shape a new ecology of "intelligence +" higher education.

1. Innovation of educational philosophy: the training focus should shift from learning knowledge to strengthening abilities.

For a long time, our education has taken knowledge impartation as its main task, while artificial intelligence is making knowledge acquisition easily accessible. Especially with the popularization of big data technology in various industries, the ability of machines to capture, mine and analyze massive amounts of data and information will be far greater than that of human beings. Under this background, talent cultivation in universities must shift from focusing on knowledge acquisition to capability enhancement. It is essential to cultivate the students' innovation abilities create something from nothing, their problem-solving skills, critical thinking and collaborative communication abilities. Furthermore, it is necessary to promote the transformation of fundamental elements, such as courses, textbooks, and experiments towards the goal of enhancing abilities, thereby accelerating the transition of "selection, teaching, learning, examination, and evaluation processes from a knowledge-oriented to capability-driven approach.

2. Upgrading of educational path: the professional structure needs to shift from passive adjustment to active upgrading.

The quality and structure of majors are directly related to the ability of higher education to support and serve the economic and social development, and they directly affect the effectiveness of universities in cultivating morality and talents. The rapid evolution of artificial intelligence technology will have a significant impact on all walks of life in the society. Therefore, the establishment of majors in universities must actively adapt to social needs, proactively lay out a number of future emerging majors, upgrade and transform a number of existing traditional majors, and eliminate a batch of backward

majors. We will encourage colleges and universities to take the initiative to adjust and optimize talent cultivation plans, accelerate the training of top-notch innovative AI talents, empower educational and teaching reform and innovation with AI, comprehensively improve the digital literacy of teachers and students, and lead industrial transformation and upgrading.

3. Teaching mode innovation: Teaching needs shift from "teacher-student interaction" to deep "teacher-student-machine" interaction

On the basis of deep learning of massive multimodal data, artificial intelligence can understand human's natural language and contextual environments provide detailed and clear explanations more quickly through its powerful computing capabilities. It makes the innovation of education and teaching forms possible. Next, the Ministry of Education will promote the deep integration of information technologies such as AI with education and teaching, carry out pilot reforms of "intelligent + education", create a batch of wisdom smart courses and "artificial intelligence + X" courses, select a number of typical cases of artificial intelligence higher education, improve teachers and students' artificial intelligence literacy, and build a new teaching paradigm of virtual-real integration and teacher-student-machine ternary interaction.

4. Transformation of learning paradigm: students should change from "passive learning" to "independent learning".

With the vast enrichment of digital resources, artificial intelligence can match learning resources more quickly and accurately based on the backgrounds and foundations of different learners, and provide personalized and accurate feedback and

path recommendations based on learners' behavioral data, achieving efficient adaptive learning. Recently, the Ministry of Education will pilot the construction of a number of "future learning centers", build smart learning spaces, explore new grass-roots learning organizations, and create ubiquitous, personalized and collaborative learning scenarios. At the same time, universities are supported to jointly establish a number of AI education innovation laboratories through industry-university cooperation, upgrade the national platform for smart education, and promote quality-driven learning, teaching, management, and research. Give full play to the principal position of students and the leading role of teachers, and promote the transformation of "passive learning" centered on teachers 'teaching to "independent learning" centered on students' needs.

5. Improvement of evaluation system: The evaluation should shift from "outcome-based evaluation" to "multi-dimensional evaluation"

The digital era has put forward higher requirements for the comprehensive quality evaluation of individuals. The integration of artificial intelligence technology has broken the traditional single-dimensional evaluation mechanism that focuses mainly on scores, strengthened the perception, collection, analysis and monitoring of the dynamic data of teachers and students, making it possible to realize the multi-dimensional evaluation of students' comprehensive quality. Colleges and universities need to adapt to the reality of teaching and talent cultivation, comprehensively utilize new technologies such as artificial intelligence, big data and achieve multi-dimensional, process-oriented, and scientific evaluation of students' comprehensive quality. They should explore the establishment based on data-driven teaching monitoring platform, build a flexible and

open mechanism for mutual recognition of digital learning outcomes, and form a comprehensive, intelligent education and teaching evaluation system based on big data..

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