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Chinese Higher Education Entering the Age of Artificial Intelligence: Opportunities, Challenges and Prospects

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Abstract: *Currently, artificial intelligence is in a period of vigorous development, with various new technologies and applications continuously emerging, which has brought many changes to our lives. Similarly, artificial intelligence has also led to disruptive changes in the field of higher education in China. Therefore, this article analyzes the opportunities and challenges posed by artificial intelligence to China's higher education, and puts forward a pioneering outlook.*

Keywords: *artificial intelligence; higher education; challenges; transformations*

1. Introduction

The development and application of artificial intelligence technology has had a significant impact on various fields, leading to transformations in various sectors. It has become a new symbol of technological revolution. Currently, countries around the world are striving to promote the development of artificial intelligence technology by continuously improving their national development strategies, hoping to maintain a leading position in technological competition. Based on the global trend of artificial intelligence technology development, China has also formulated relevant development reports, regarding the development of artificial intelligence technology as a major opportunity for the country's development.

2. The current situation of higher education in the context of artificial intelligence

With the accelerating development speed of the internet, artificial intelligence technology has been applied in many fields, and its integration with higher education is one of the most representative, laying a solid foundation for students to carry out personalized learning and self-adaptive learning. The Chinese government has also issued many policy measures, such as "The Development Plan for a New Generation of Artificial Intelligence" and "Education Informatization 2.0 Plan". These documents clearly point out that in the process of carrying out higher education, we should make full use of technologies such as cloud computing, big data, and artificial intelligence to improve the overall learning quality and efficiency of students.

2.1 The development of artificial intelligence technology lacks solid data support

If we want to ensure the maximum realization of the value of artificial intelligence technology, the key is to use high-quality data as its foundation. For artificial intelligence, effective recording of the data generated by the entire teaching process of teachers should be done. This approach can also ensure that students can make full use of it in the later learning process. However, from the perspective of current reality, although artificial intelligence technology has been applied, it has not carried out full-process recording of the actual teaching process of teachers and the entire learning process of students, making it difficult to carry out reasonable learning from multiple perspectives, and the integration of the two still faces many difficulties. In addition, due to the differences in the education field, there are still many problems in the process of data processing, such as non-uniform data standards and incomplete collection, etc., which also result in low-quality data collection in the end. Thus, it is difficult to implement personalized services effectively, and learning also lacks good accuracy.

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2.2 The development of artificial intelligence technology lacks a clear understanding among teachers

In practice, many frontline teachers in universities have not fully realized the important value of the integration between artificial intelligence and higher education. Firstly, these teachers do not know how to achieve collaborative teaching with artificial intelligence in the process of education. Secondly, some teachers are afraid that the combination of the two may lead to a loss of their own dominant position*[1]* . Finally, there are still many entities in society who believe that if artificial intelligence replaces the daily work of teachers in the process of higher education, it may create a negative impression of the dominant status of teachers.

3. Challenges to higher education in the context of artificial intelligence

In recent years, the rapid development of artificial intelligence has had a huge impact on higher education. The emergence of artificial intelligence, especially AI robots, has gradually replaced technical and labor-intensive industries with artificial intelligence, resulting in a decline in vocational education focused on professional skills. As a result, the scale of higher vocational colleges has gradually diminished, while the scale of undergraduate education has relatively expanded. At the same time, the development of AI high-end industries has also led to an increasing demand for education of high-end talents such as graduate students. Such impacts will become increasingly evident as artificial intelligence continues to develop. Secondly, the emergence of artificial intelligence will change the teaching mode of higher education. Artificial intelligence can replace teachers to teach knowledge in real-time and efficiently evaluate students' academic levels objectively. Therefore, teachers should change the original teaching content, no longer focus only on imparting knowledge and cultivating student abilities, but rather on cultivating students' creative thinking. Meanwhile, the development of artificial intelligence also promotes the change of teaching form and evaluation system from traditional classroom teaching to virtual classroom teaching*[2]*. Finally, the application and development of artificial intelligence have promoted the transformation of management methods. The implementation of virtual classrooms based on artificial intelligence technology requires the corresponding setting of scale and learning system. The application of artificial intelligence requires schools to re-plan their teaching resources reasonably, and the teaching resources replaced by artificial intelligence need to be utilized reasonably again. In conclusion, the advent of the artificial intelligence era has greatly impacted the scale of schools, educational system, teachers, and students in higher education.

4. The Prospect of higher Education in the age of artificial Intelligence

4.1 Improvement of the level of artificial intelligence in higher education to achieve an intelligent teaching model

In recent years, many countries have been exploring the development path of education in the context of the era of artificial intelligence. In order to improve the quality of higher education in China, our country is also vigorously improving the level of artificial intelligence in higher education. To achieve this, it is necessary to break the time and space limitations of education, increase the construction of AI-based educational resources and real-time sharing, and adopt flexible forms of education. At the same time, in the management process, it is necessary to simplify the management process and achieve automatic management by using artificial intelligence technology, thus improving the efficiency and quality of management*[3]* . Finally, relevant AI technology training should be given to teachers and students so that they can proficiently apply artificial intelligence technology to achieve comprehensive improvement in teaching and learning. Therefore, investment in AI education should be increased to improve the level of AI higher education.

4.2 Development of corresponding talent training methods and training objectives

The application of artificial intelligence provides students with more learning opportunities and improves the quality of education, which is significantly different from traditional talent training methods. Therefore, according to the existing situation, reasonable talent training methods and training objectives should be formulated. In the context of the era of artificial intelligence, teaching is no longer just about imparting knowledge and cultivating students' learning ability. Instead, emphasis should be placed on cultivating students' creative thinking, independent thinking ability, innovation ability, and shaping their values, making them talent with sound personality and both virtues and abilities. At the same time, the

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scale of skilled talents should be reduced, the structure of talent training adjusted, and the proportion of personalized training and large-scale education changed, achieving a transformation in learning methods.

4.3 Strengthening of the training of teachers and enhancing their professional abilities

The development of artificial intelligence technology will gradually make teaching that focuses on entrance examinations and repetitive skill practice be replaced. However, however advanced artificial intelligence becomes, it cannot replace human emotional communication or the functions of innovation and exploration. It is merely a carrier of large amounts of data and a machine with powerful computing capabilities. Under these circumstances, the application and development of artificial intelligence require higher education practitioners to improve their own abilities. In addition to having a strong knowledge of the subject, teachers must be able to adopt flexible teaching methods and also proficiently use artificial intelligence devices, which would enable them to switch roles in an artificial intelligence environment. Therefore, it is necessary to not only strengthen teachers' professional skills training but also enhance their cognitive skills training so that they can educate and guide students through their own behaviors, emotional intelligence, and good interpersonal skills. Thus, teachers need to change their traditional education ideas and enhance their abilities from all aspects, improving their ability to apply artificial intelligence and adapt to its development.

4.4 Strengthening of cooperation among educational institutions

Artificial intelligence has changed people's production and learning methods, allowing humans to enter the intelligent era of harmonious cooperation and co-creation with machines. In this era, higher education institutions should achieve resource sharing in data resources and intelligent technologies, ensuring maximum utilization of such resources. For fields such as the arts, course resources and assessment results can be mutually recognized between social educational institutions and higher education institutions. Through artificial intelligence platforms, various educational institutions can facilitate communication among artificial intelligence professionals. Strengthening collaboration among education organizations can promote the development of higher education talent.

4.5 Promoption of changes in schools and classes, the two main basic educational organizations

The transformation of higher education by artificial intelligence is primarily reflected in the changes happening in schools and classrooms. For instance, the universities have been transformed into "Smart Campus", where students can perform various operations using the Smart Campus system. Taking Peking University's Smart Campus as an example, the system consists of two main components: one for teachers and one for students. Teachers can use the system to handle tasks such as office work, academic affairs, financial matters, project applications, personnel transfers, procurement, and degree registrations. On the other hand, students primarily engage in activities like library book borrowing, campus card management, electronic registration, graduate student administration, and appointment reimbursements. The implementation of the "Smart Campus" brings online management to campuses, providing convenience for both teachers and students. It can be seen as the beginning of intelligent transformation in higher education.

Taking iFLYTEK as an example, it is a leader in the smart campus industry. In 2016, iFLYTEK introduced its smart campus implementation plan, which relies on big data and artificial intelligence technologies. This plan integrates teaching, examination, learning, and management into a unified system, providing teachers and students with a comprehensive intelligent perception of the campus environment and a comprehensive information service platform. It helps teachers personalize instruction, enables administrators to implement regularized management, and assists students in online learning. It should be noted that iFLYTEK has developed an intelligent scheduling system based on neural networks and deep learning techniques to meet the needs of different courses, classes, and teachers. This system alleviates the management pressure on educational administrators. From 2016 to 2019, the smart campus concept has matured and is gradually changing traditional educational methods.

5. Conclusion

Future higher education may undergo significant changes in several key aspects:

(1) Innovation-driven: Currently, China's higher education has made significant progress with the

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help of technology. However, it mainly relies on the allocation of educational resources, and the quantity of education recipients to a certain extent guarantees the enrollment rate, while problems in the development process of education are revealed: Weak driving force of innovation. Combining artificial intelligence with education can provide abundant momentum for educational transformation, leading to significant improvements in future educational innovation in our country. Artificial intelligence technologies have already been applied in some schools, such as facial recognition, speech recognition, short-text analysis, image recognition, and intelligent grading systems. These advancements are driving continuous progress in educational reform.

(2) Restructuring: Artificial intelligence is reshaping the structure of higher education, both internally and externally. AI promotes optimization of educational resources by providing high-quality education platforms to individuals in different regions. A group of high-quality video courses, including national excellent courses, are freely distributed on the Internet, facilitating the circulation and accessibility of educational resources, and promoting educational equity. This represents an external structural transformation. At the same time, artificial intelligence also improves the teacher-student relationship. It allows teachers to have more time to fully focus on individual students, caring about their growth and development. Teachers are not only transmitters of knowledge but also guides for students' growth and mentors for emotional development. This represents an internal transformation.

(3) Open Ecosystem: The government has put forward the slogan of "mass entrepreneurship and innovation," and in the era of artificial intelligence, education should actively respond to this call and contribute to cultivating innovative talents. In the intelligent era, higher education is gradually moving from the ivory tower of knowledge towards "openness." The open sharing of collective wisdom provides a solid foundation for the continuous evolution of higher education. For example, when designing smart educational products and platforms, it is beneficial to invite participation from various fields such as government, industry, commerce, and academia. By optimizing the user experience from the perspective of students and incorporating feedback from the public, multiple benefits can be achieved. This allows higher education to become an open window to society, where it interacts with various elements of social development, creating a mutually beneficial relationship between education and society.

The application of artificial intelligence technologies such as virtual reality, speech recognition, and image recognition has greatly impacted higher education, leading to significant changes in its structure and format. Students can receive education anytime and anywhere through artificial intelligence devices and platforms, presenting a significant challenge to traditional education. Faced with this situation, higher education institutions should strengthen AI education for teachers and students, integrating artificial intelligence with teaching and learning to promote the healthy development of higher education.

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