

The Opportunities, Challenges and Realization Path of Educational Equity in the age of Artificial Intelligence

He Tang^a, Quan Chen

College of Teacher Education, Jiangsu University, Zhenjiang, Jiangsu, China

^a1986137626@qq.com

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Abstract: Educational equity is the key issue of global education development. Technology enabling education provides an important opportunity to improve learners' personalized learning style, optimize the allocation of educational resources, and perfect education management information system. However, it also faces new challenges such as insufficient digital core literacy, imperfect construction of digital infrastructure and prominent ethical issues of artificial intelligence to meet technology enabling education. It is suggested to use intelligent technology to improve citizens' digital core literacy; Increase investment in education and strengthen digital infrastructure; Formulate education laws and regulations, resolve prominent ethical problems of artificial intelligence and other aspects to deal with, narrow the education gap, and realize education equity.

1. Introduction

After the three industrial revolutions of "mechanization", "electrification" and "automation", the fourth industrial revolution of "intelligence" has arrived. ^[1]Artificial Intelligence (AI), as the core technology of the fourth industrial revolution, ^[2]has a huge impact on global medical care, transportation, economy, education, etc. Technology-enabled education is the major trend of future education reform, especially since the COVID-19 epidemic. Online courses and remote service systems relying on artificial intelligence technologies such as the Internet, cloud computing and big data play a huge role in optimizing the allocation of global educational resources and promoting educational equity. Intelligent technology is the internal force of education system reform, accurately grasp the opportunities and challenges of technology-enabled education, and put forward targeted countermeasures and suggestions, so as to promote educational equity.

2. Opportunities for educational equity in AI

In the 1970s, AI technology was initially applied in the field of education. At the time, researchers focused on how computers could replace one-to-one tutoring. With the continuous progress of technology, the application of artificial intelligence in the field of education presents a diversified trend, and through technology-enabled education, to improve learners' personalized learning methods, optimize the allocation of educational resources, improve the education management information system, to promote education equity.

2.1. AI improves personalized learning

Educationalist Torsten Husen believes that educational equity is every learner's most basic right to receive education, ^[3]and ensuring educational equity (including educational starting point, educational process and educational outcome equity) is the basic guarantee for learners to achieve comprehensive and harmonious development of personality. Information technology in the era of artificial intelligence provides an unprecedented opportunity to meet the needs of learners' personalized learning. The rapid development of artificial intelligence technology makes the artificial intelligence system supported by machine learning can carry out real-time monitoring on the teaching process of teachers, ^[4]teachers can fully grasp the learning process and emotional state of students during learning from the monitoring data, and test the learning effect, so as to provide effective feedback

information for teachers, and provide data support for teachers to guide students' personalized learning. Thus, the personalized development of learners can be realized. For example, the artificial intelligence guide system, which is the most common artificial intelligence application in the field of education at present, the working mechanism of the system is: Around the problems in structured subjects such as mathematics and chemistry, the method of step-by-step teaching is adopted to customize personalized learning programs for each student. ^[5]At the same time, the system will optimize students' learning materials according to the opinions of experts in related fields, organize learning activities in line with students' personality development, and timely answer the academic puzzles of individual students. So as to provide an optimized learning path for each student, to meet the needs of students' comprehensive development and personalized development.

2.2. AI optimizes the allocation of resources

The age of artificial intelligence makes it possible to acquire open educational resources (OER).^[6]With the continuous technological innovation in the field of education, some less developed countries and regions can make full use of open education resources to promote the development of education in their own countries and regions. In addition, the era of artificial intelligence spawned by MOCC, in the delivery of high-quality education resources, make up for the unequal distribution of global education resources, and maintain global education equity is playing a huge role. With its characteristics of openness, free and inclusiveness, MOCC is widely popular around the world. By building a free learning platform, MOCC provides rich learning resources and equal educational opportunities for learners from different development levels and economic conditions around the world. Technology enabled education promotes the optimal allocation of global educational resources and realizes the high-quality sharing of global educational resources. With the help of technological innovation, global high-quality educational resources can flow to poor areas, so that all people can obtain massive educational resources conveniently and quickly, and ensure the fairness of the education process. At present, there is still the problem of unfair distribution of educational resources caused by unbalanced economic development in China.

2.3. AI improves the educational management information system

With the continuous optimization and upgrading of the Internet, the Internet of Things, big data, cloud computing and other technologies, education management information systems (EMIS) have been given more new roles. The working principle of the system is to use artificial intelligence technologies to analyze educational big data, generate accurate and effective school education reports, and provide data support for schools to improve education quality. According to the education report data information, while optimizing education and teaching, the school can use the artificial intelligence data analysis system to predict, analyze, evaluate and feedback the learning state, learning process and learning results of the students, so that the teachers can understand the learning dynamics of the students in real time, and accurately position the learning effect of the students, so as to optimize the teaching design, according to the personality differences of the students, Teach students according to their aptitude, so that each student can develop their strengths and circumvent their weaknesses, save losses and get the best development. Artificial intelligence technology innovation provides technical support for the optimization and upgrading of education management information system, improves the efficiency of data collection and processing of education management information system, realizes more fair, just, open, safe and efficient education management.

3. Challenges to educational equity in the age of AI

While technology-enabled education has a bright vision for promoting educational equity and improving educational quality, it is also likely to exacerbate existing educational inequalities. For example, artificial intelligence education systems may exclude the most marginalized groups from the system, ignore the educational demands of their vulnerable groups, and create new education gaps and knowledge gaps.

3.1. Lack of digital core literacy

To some extent, the realization of global educational equity in the era of artificial intelligence depends on the level of digital core literacy of learners. In the era of artificial intelligence, key technologies such as Internet, big data, cloud computing and virtual reality (VR)+ augmented reality (AR) enable learners to obtain more educational resources and experience conveniently and quickly, and meanwhile, it means that learners' digital core literacy needs to be improved synchronously. On the one hand, learners need to have the traditional information literacy, on the other hand, they also need to have the computer thinking as the core of the intelligence literacy. ^[7]In the era of artificial intelligence, faced with a large number of learning resources, many young people lack the awareness of digital core literacy, the ability to distinguish the adaptability of information, according to their own needs to search learning resources, and to distinguish the truth from the fake information.

3.2. Digital infrastructure construction needs to be improved

Strengthening the construction of digital infrastructure in all countries is the foundation for promoting the equitable development of education. If the construction of digital infrastructure is not perfect, the equalization of educational resources and the equality of education will be difficult to achieve. According to UNESCO's latest Global Education Monitoring Report, most countries in sub-Saharan Africa have some information and communication technology (ICT) plans in place, but few have achieved them. The backward construction of digital infrastructure has severely blocked the open sharing of educational resources. Especially during the COVID-19 pandemic, most countries in the world, especially poor countries such as Africa, are unable to ensure students' normal classes due to the backward development of artificial intelligence technologies such as Internet, cloud computing and big data.

3.3. The ethical issue of AI is prominent

In the information age, artificial intelligence technology in the field of education has been developing rapidly, but at the same time, the ethical problems of artificial intelligence education are becoming more and more serious, mainly manifested as the right to privacy and the right to know. With the emergence and use of artificial intelligence education applications, ^[8]while helping teachers accurately understand students' learning needs, improving teachers' teaching level, and satisfying students' personalized learning, problems such as weakening teachers' dominant position in the teaching process and infringing students' learning privacy also appear. The application of artificial intelligence in the field of education has the disadvantages of dehumanization. For example, artificial intelligence-driven electronic cameras installed in school classrooms monitor students in real time, which seriously violates students' privacy rights.

4. The enlightenment of technological innovation on educational equity

It is an important research trend in the era of AI to examine educational equity from the perspective of technology-enabled education. It is necessary to improve citizens' digital core literacy; Increase investment in education and strengthen digital infrastructure; Actively pay attention to the ethical issues of AI three aspects to promote education equity.

4.1. Improve citizens' digital core literacy

Improving digital citizen literacy can effectively improve the core literacy, avoid the exacerbation of the digital divide at the second level, so as to speed up the realization of educational equity in our country. On the one hand, we should promote universal education of digital core literacy to eliminate digital illiteracy, so that every Chinese citizen can enjoy the convenience brought by technological innovation, independently acquire relevant knowledge using existing scientific and technological tools, and promote their own growth and progress. National education authorities and public welfare organizations can provide policy support and resources to marginalized groups to improve their digital literacy. For example, the government can introduce policies on digital literacy training for citizens, provide relevant learning platforms and content for all groups in society, and provide

financial subsidies for low-income groups to enhance the learning enthusiasm of all groups in society. Based on the current situation of digital literacy education in China, this paper draws on the educational experience of other countries, and starts with educational content and educational methods to gradually improve the quality of digital literacy education. In order to judge whether digital literacy education plays a positive role in promoting educational equity and promoting sustainable development of education, real-time monitoring and accurate feedback will be conducted on citizens' learning results and digital application ability.

4.2. Strengthening digital infrastructure

The degree of perfection of digital infrastructure is an effective indicator to measure educational equity in the era of artificial intelligence. By improving all kinds of infrastructure, optimizing technological tools, and establishing a smart learning ecological environment, students' diverse learning needs can be met. On the one hand, relying on technological innovation to optimize the education database, build the interactive education cloud platform of various regions, realize the optimal allocation of education resources, set up special databases for teachers, students and school organizations, realize the cross department, cross-region and cross-level flow of data, and realize the common sharing of data. On the other hand, we will improve the construction of intelligent teaching facilities, build virtual teaching and research rooms, upgrade teaching equipment, optimize the teaching environment, support teachers' high-definition live broadcasting of classes, interactive communication between teachers and students across time and space and other diversified teaching organization methods. Relying on technological innovation, especially the development of 5G technology, AR+VR simulation classrooms will be established to create vivid and intuitive new classrooms.

4.3. Pay attention to the ethical issues of AI

With the popularization of the application of artificial intelligence technology in the field of education, the ethical issues of artificial intelligence education are becoming more and more prominent. The introduction of artificial intelligence technology in the field of education is a double-edged sword, we should learn to seek advantages and avoid disadvantages.^[9] On the one hand, according to the Recommendation on the Ethical Issues of AI issued by UNESCO, an AI ethical code in line with China's national conditions should be formulated to protect the data privacy of teachers and students. On the other hand, government departments will introduce corresponding AI governance pattern plans. Policy makers in the education sector need to deepen understanding of the unique ethical issues in the application of AI in the field of education, so as to further regulate the data use methods of learners, prevent algorithmic discrimination, and curb intrusive AI tools. We attach great importance to the ethical issues brought by the application of AI technology in the field of education, in order to realize the educational equity in our country.

5. Conclusion

At present, the development of intelligent education has become a global consensus, and technology-enabled education provides a basic guarantee for promoting educational equity. Technology enabling education should focus on ensuring equity of educational opportunities and give consideration to equity of educational process and results. Our country should accelerate the pace of technological innovation, build a more equitable and just educational ecosystem through technological innovation, build a high-quality education target system, and promote the sustainable development of education.

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