

Early Childhood AI Education in China: Time Value and Path Exploration

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Hainan Provincial Education Science Planning Project: Research on Strategies for Enhancing Digital Literacy of Rural Preschool Teachers under the Educational Digitalization Strategy (QJY20231071)

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Abstract

With the rapid development of artificial intelligence technology, the integration of artificial intelligence and early childhood education is becoming more and more extensive. This article mainly examines the implementation of early childhood artificial intelligence education in China, paying special attention to the value of early childhood artificial intelligence education in promoting the all-round development of young children, transforming education and teaching, and promoting the high-quality development of preschool education. As well as many new challenges such as the integration of AI technology and early childhood education brought by artificial intelligence for children, the transformation of the role of teachers, the imbalance of artificial intelligence education resources, social ethics, privacy and security issues. According to the existing problems, this study provides some suggestions from the aspects of technical support, teaching reform, policy support, etc., in order to help the development of early childhood artificial intelligence education in China. Of course, this study mainly analyzes the problem from the perspective of qualitative research, and further qualitative research is needed to carry out in-depth investigation.

Keywords: Early Childhood Education, Artificial Intelligence, High-Quality Development.

Introduction

Preschool education is an indispensable part of China's education, accelerating the construction of a high-quality preschool education system and unwaveringly promoting the high-quality development of preschool education has become the fundamental position of the development of preschool education in China (Hou Limin&Liu Qian,2023. Since the Outline of the National Medium and Long Term Education Reform and Development Plan in 2010 put preschool education in a priority position, China's preschool education has achieved leapfrog development, the number of kindergartens has been increasing, the government investment in preschool education has been increasing, and the team of preschool education teachers has been growing, solving the fundamental problem of "difficult to enter the kindergarten and expensive to enter the kindergarten". According to the data of the Ministry of Education, as of 2023, the gross enrollment rate of preschool education in China has

reached 91.1%, realizing the universal education of preschool education and completing the planning goal of the "14th Five-Year Plan" ahead of schedule. The development of preschool education has also changed from the pursuit of "quantity" to the pursuit of "quality" development. The report of the Party's 20th National Congress has pointed out the direction for the development of China's education cause, and it is necessary to "adhere to the people-centered development of education, accelerate the construction of a high-quality education system, develop quality education, and promote educational equity." (Bulletin of The State Council of the People's Republic of China, 2022). Accelerating the construction of high-quality preschool education is not only the people's pursuit of "young education" to "young good education", but also an important guarantee for realizing the great rejuvenation of the nation.

With the rapid development of artificial intelligence, digitization, informatization and intelligence have become the trend of global development. So far, artificial intelligence has been widely used in business, science, art, education, medicine and other fields. Many OECD countries consider AI-related policies and industries to be the most important technology for future development (OECD, 2017), and regard it as one of the core competencies that future citizens should understand and use. Some developed countries and regions have begun to carry out artificial intelligence education in K-12 and have achieved some research results.

The Chinese government released the "New Generation Artificial Intelligence Development Plan" in 2017, emphasizing the importance of developing artificial intelligence education to proactively address the new opportunities and challenges brought about by emerging technologies. Currently, it is essential to discuss the value of early childhood artificial intelligence education in China, identify existing issues in the integration of early childhood education and AI, and explore methods to accelerate this integration. This will ultimately contribute to providing higher quality development for early childhood education.

Significance of Study

Artificial intelligence (AI) is often referred to as the Fourth Industrial Revolution. A policy foresight report by the European Joint Research Council (Tuomi, 2018) indicates that "in the coming years, AI will transform learning, teaching, and education. The pace of technological change will be rapid, placing significant pressure on educational practices, institutions, and policies." Many OECD countries recognize that AI-related policies and industries are among the most critical technologies for future development (OECD, 2017). Numerous nations prioritize the advancement of AI technology as one of the core competencies that future citizens should understand and utilize (Denning & Tedre, 2019). In 2020, the U.S. Department of Defense released its "Artificial Intelligence Education Strategy," which aims to lead in AI development through initiatives such as promoting AI advancements, developing AI tools, enhancing applications of AI, and improving workforce literacy in this domain. These efforts are intended to cultivate global leaders in artificial intelligence while ensuring national security and economic prosperity as well as maintaining America's leading position in international AI technology. In July 2017, China's State Council issued a "New Generation Artificial Intelligence Development Plan," elevating artificial intelligence to a strategic level within national development for the first time. In April 2018, responding to the needs arising from developments in education under an intelligent environment influenced by AI technologies, China's Ministry of Education launched an "Action Plan for Educational Informatization 2.0," emphasizing smart education while proactively addressing new

opportunities and challenges brought about by emerging technologies. Therefore, this study aims to explore current values related to early childhood integrated education with artificial intelligence in China; investigate existing issues; propose solutions; ultimately providing direction and problem-solving strategies for advancing early childhood artificial intelligence education in China's future.

Current research has shown that children enhance their computational thinking and problem-solving abilities through activities involving artificial intelligence (Su & Yang, 2022), and improve their knowledge of AI through dedicated AI courses (Williams, Park, Oh, & Breazeal, 2019). Furthermore, preschoolers who engage with AI robots have demonstrated improvements in various inquiry skills—namely creative inquiry, emotional inquiry, and collaborative inquiry skills (Kewalramani et al., 2021). Existing studies provide evidence that the application of artificial intelligence in early childhood education is effective. The significance of this paper lies in its call to transform traditional educational paradigms in China. It emphasizes the necessity for conventional education to embrace the wave of AI advancements. The methods employed in traditional early childhood education must integrate with AI technologies so that more children can benefit from AI-driven educational experiences. This integration aims to provide higher-quality early education and ultimately enhance children's overall competencies as they develop into the future.

An Overview of AI Education for Young Children

Artificial intelligence

Artificial intelligence, known as the fourth industrial revolution, has profoundly affected and changed our lives, such as smart home appliances, smart phones, automatic recognition of voice and image. First defined in 1956 as "the science and engineering of creating intelligent machines," (McCarthy, 2007). Artificial Intelligence has evolved over the past few decades into intelligent machines and algorithms that can reason and adapt according to rules and environments that mimic human intelligence (McCarthy, 2007). With the development of AI technology, AI is being redefined as one that can perform cognitive tasks, especially learning and problem solving, through exciting technological innovations such as machine learning, natural language processing and neural networks (Wang et al., 2019).

Touretzky et al (2019), present five "big ideas" about artificial intelligence :1. Perception: Computers use sensors to perceive the world. 2. Representation and reasoning: Agents maintain representations of the world and use them to reason. 3. Learning: Computers can learn from data. 4. Natural interaction: Intelligent agents require a variety of knowledge to interact naturally with humans. Social impact: AI can impact society in both positive and negative ways. Through the development and progress of technology, artificial intelligence enables machines to have or even surpass human intelligence, helping humans to understand, perceive the world and solve problems.

Artificial Intelligence Education

The integration of artificial intelligence and education has formed a new education model: artificial intelligence education. Artificial intelligence education generally refers to the use of artificial intelligence technology in education to support and enhance student learning, and enrich teachers' educational practice and students' learning experience through the technological possibilities supported by artificial intelligence (Chen, 2019). There have been

many studies on AI education at home and abroad, and some scholars believe that AI education is mainly about learning and understanding AI, using AI purposefully, interacting with AI, and recognizing the ethical issues and values of AI in the world (Zhang, & Aslan, 2021). AI methods have been incorporated into educational technologies to improve interaction with students and used in educational Settings to meet a variety of educational needs (Roblyer, 2007). Chinese scholar Peng Shaodong also believes that artificial intelligence is a technology, widely used in various fields of education, the goal of high performance education has become a reality, the use of artificial intelligence with big data analysis, depth perception and other technologies to bring about changes in education (Peng, 2021).

According to existing research, artificial intelligence has been widely used in special education, music education, nursing education, STEM science education and other education fields. In the field of education, AI can help teachers predict students' learning status and performance, recommend learning resources, and automatically evaluate to improve students' learning experience through intelligent agent systems, chatbots, and recommendation systems. Artificial intelligence education is the effective integration of technology and education, and is the beginning of a new educational revolution.

Artificial Intelligence Education for Children

The first idea for teaching children artificial intelligence was proposed by Cynthia Solomon and Seymour Papert in 1971. They want kids to explore artificial intelligence through LOGO programming and turtle robots (Seymour Papert & Cynthia Solomon, 1971). Some people may think that kindergarten children are too young to learn and explore AI knowledge. However, there have been studies that have brought artificial intelligence tools into early childhood education classrooms. For example, some foreign scholars have used Pop Bots intelligent toys, knowledge-based systems, supervised machine learning and generative artificial intelligence to teach children artificial intelligence concepts (Williams, R & Breazeal, 2019) and have shown good results. In fact, early AI education is important for improving many aspects of child development, such as theory of mind skills, creative inquiry, emotional inquiry, and collaborative inquiry (Kewalramani, Kidman & Palaiologou, 2021). Of course, there are also concerns that AI education will also bring new inequities and moral and ethical issues, which are also important issues that need our attention and research.

The American Association for the Advancement of Artificial Intelligence (AAAI) and the Computer Science Teachers Association (CSTA) formed a joint task force in May 2018 to develop national guidelines for the teaching of AI to K-12 students (AAAI, 2018). In line with the CSTA's National Standards for K-12 Computer Education (CSTA, 2017), the K-12 Artificial Intelligence Recommendations (ai4k12.org) identify what students at every grade level should know about artificial intelligence, machine learning, and robotics. In some developed countries and regions, children's artificial intelligence education has moved from theory to practice. In the future, the international competition in the world will be more intense, we must have a sense of urgency, responsibility and sense of mission, we must seize the opportunity of the development of artificial intelligence technology to raise the development of early childhood artificial intelligence education to the height of the national strategy, and promote the high-quality development of preschool education.

Methodology

This study mainly introduces the current development of early childhood education in China through qualitative research methods. We limit the keywords of this paper to artificial intelligence, artificial intelligence education, and early childhood artificial intelligence education, and conduct a relatively comprehensive review and analysis of relevant research in China in recent years. These studies, including peer-reviewed journal articles, conference proceedings, and government documents, provide a comprehensive look at the current issues and challenges in the development of early childhood AI education in China.

The Times value of the development of infant AI education

Children's Artificial Intelligence Education is an Important Driving Force to Promote the Comprehensive Development of Children

The all-round development of human beings is the essential pursuit of Marxism. Marx believed that meeting people's needs, enriching social relations, and fully developing personality and ability are the main manifestations of people's all-round development. Early childhood is the key stage of life development, preschool education stage as the basic stage of training people, bear the heavy responsibility of children's physical and mental health and comprehensive development. Artificial intelligence education enables the high-quality development of pre-school education and provides an important driving force for the all-round development of young children.

Children's artificial intelligence education organizes educational activities through artificial intelligence tools, platforms and games to stimulate children's curiosity and desire to explore. Some AI tools, intelligent robots, AI toys, and AI platforms (such as Pop Bots) have begun to be applied to early childhood education and have achieved good results. AI games are designed to guide children in activities such as problem solving, logical reasoning and pattern recognition, thereby promoting the development of children's cognitive abilities. Ai-driven educational apps and robots can provide a rich language learning environment for young children. Through dialogue exercises and language games, children can improve their vocabulary, grammar understanding and language expression ability, and improve their language skills. The AI intelligent education platform can simulate real social interaction and help children learn social rules and emotional expression, thus improving children's social emotional ability. AI tools can provide an open creative environment that encourages young children to freely explore and express their ideas. Through creative activities such as programming, drawing and music, young children's imagination and creativity are cultivated. Through early exposure to and learning about AI, young children can better adapt to future technological changes and be prepared for future learning and careers. Show the value of The Times

Early Childhood Artificial Intelligence Education is a Key Driving Force For Transforming Education and Teaching

In 2019, UNESCO published AI in Education: Challenges and Opportunities for Sustainable Development, pointing out that AI will have a direct impact on learning styles, learning opportunities, learning quality, student capabilities, teacher development and more. Artificial intelligence is changing our lives and will also change the traditional education model. On the one hand, artificial intelligence can be used as an efficient technology application to "empower" the "external" human, environment and resources of education: by simulating, enhancing and expanding human cognitive ability, it can provide solutions to problems

beyond the inherent limitations of human beings for education, and enhance the quality and efficiency of education. On the other hand, it can also be used as a new way of thinking to "intellectualize" the "inner" ideas, knowledge and methods of education (Yang Xin, 2020) Traditional teaching relies on the classroom to complete the interaction between teachers and students, and between students, in which teachers assume the role of "knowledge imparts, value guides, role models, and evaluators". However, artificial intelligence provides more intelligent, efficient and convenient intelligent resources and tools for children, the direct interaction between people has become human-computer interaction, collective teaching has become personalized learning, the traditional teaching model will inevitably be changed or even subverted, and the role of teachers will also change. Some scholars believe that the role of teachers will change from "all-rounder" to "specialist", from "teacher" to "assistant", from "coach" to "mentor"(Zhang & Shang 2019).

At present, artificial intelligence conducts data-driven analysis and induction and precise decision-making through iterative and evolvable algorithms and models, and is widely used in intelligent tutoring, microteaching, adaptive learning, immersive learning, automatic assessment, classroom evaluation, data decision-making, intelligent governance and other scenarios, promoting education reform and innovation (Yang & Ren,2021). The integration of artificial intelligence and early childhood education will inevitably promote the innovative development of education and teaching, and further promote the high-quality development of preschool education.

Early Childhood Artificial Intelligence Education is a New Quality Productivity to Promote the High-Quality Development of Preschool Education

The new quality productivity is an advanced productivity quality that plays a leading role in innovation, gets rid of the traditional economic growth mode and productivity development path, and has the characteristics of high technology, high efficiency and high quality, and is in line with the new development concep(CCTV Network,2024). The core of new quality productivity lies in scientific and technological innovation, emphasizing the revolutionary breakthrough of technology, and aiming at high-quality development. Artificial intelligence is a strategic technology that leads the future, in line with the core concept of new quality productivity, and the integration of artificial intelligence and early childhood education will effectively improve and enhance the quality of preschool education.

Artificial intelligence education has been incorporated into national strategic planning in many countries. In 2016, the US National Science and Technology Council issued "Preparing for the Future of Artificial Intelligence", proposing to integrate artificial intelligence with the national education system; In 2017, the UK government published "Developing Artificial Intelligence in the UK", which proposed the widespread embedding of data science and artificial intelligence in education; In 2020, the European Union published its White Paper on Artificial Intelligence, which proposes to make better use of data - and AI-based technologies to improve education and training systems through learning and predictive analytics (Liu et al., 2021). China also attaches great importance to the development of intelligent education. In the "New Generation of Artificial Intelligence Development Plan" issued by The State Council in 2017, it is emphasized that "intelligent technology is used to accelerate the reform of personnel training models and teaching methods, and a new education system including intelligent learning and interactive learning is built"(SCCC of China, 2017). In order to realize

the great rejuvenation of the Chinese nation and the construction of a high-quality education system, we must keep up with the pace of the development of The Times and attach importance to the development of artificial intelligence for children. The development of early childhood artificial intelligence education will certainly become a new quality productivity to promote the high-quality development of preschool education.

Practical Problems in the Development of Infant AI Education

As an emerging education model, early childhood artificial intelligence education has shown great potential in promoting the comprehensive development of young children and improving the quality of education, but it will also face a series of difficulties and challenges.

Challenges of Integration of Artificial Intelligence Technology and Early Childhood Education

Early childhood artificial intelligence education needs the close combination of early childhood education needs and AI technology. Teachers need to master how to effectively integrate AI tools into instructional design, as well as understand how to evaluate and select technology products that are appropriate for young children's developmental stages. However, at present, many preschool teachers lack sufficient knowledge and experience in the application of artificial intelligence. On the other hand, the technical personnel of artificial intelligence lack the knowledge, principles and methods of education and teaching, and the understanding of the characteristics of children. This makes it difficult to integrate AI technology with early childhood education. The design and application of artificial intelligence educational products should not only conform to the laws of educational development, but also take into account the developmental characteristics and cognitive level of children. Some AI educational software may be too complex or not in line with children's learning interests, resulting in children's difficulty to participate in or benefit from it. Therefore, developers need to deeply study the developmental needs of young children and design more appropriate educational content and interaction methods.

Challenges of Teacher Role Transformation

As an old Chinese saying goes : Teachers are also those who preach and receive instruction. Teachers bear the important responsibility of teaching and educating people, and realize the transmission and interaction of knowledge and emotion between "teachers - students" and "students - students" in the field of classroom teaching. In this process, teachers assume the role of knowledge transfer, value guidance, example demonstration, evaluation and evaluation. But the integration of artificial intelligence will change the traditional roles and responsibilities of teachers. Human-computer interaction is a typical feature of artificial intelligence education, such as the application of chatbots, intelligent tutoring, and intelligent scoring systems. Therefore, the scene of children's activities will become the interaction between "students - machines - teachers", and the interaction between "teachers and students" will be greatly weakened by the interaction between "students-machines", and the roles of knowledge transmission and evaluation will even be replaced. Unlike the traditional group teaching model of teachers, AI will provide more personalized guidance based on young children's learning interests and feedback. Some scholars pointed out that "teachers who know how to use AI may replace teachers who do not know how to use AI, because AI can empower teachers and promote their role transformation, thus greatly improving management efficiency and decision-making level" [21]. Therefore, in the face of the rapid development of artificial intelligence, preschool teachers must face the difficulties and

challenges of role transformation, integrate teaching knowledge and content with artificial intelligence technology and methods, and constantly improve their professional quality.

Challenges Posed by the Imbalance of AI Educational Resources

The imbalance of early childhood artificial intelligence education resources is another growing challenge, which affects the quality and equity of early childhood education. The implementation of AI education relies on the support of hardware facilities and software resources, such as intelligent teaching robots, interactive learning software and personalized learning platforms. Kindergartens in economically developed areas are often able to introduce and apply the latest artificial intelligence education resources more quickly. In contrast, kindergartens in economically underdeveloped areas may find it difficult to obtain these advanced education resources due to insufficient funds, backward infrastructure and lack of professional talents (Luckin et al.,2016). Secondly, the imbalance of educational resources is not only reflected between regions, but also exists between families with different socio-economic backgrounds. The economic situation of the family and the educational level of the parents often determine whether young children have access to AI educational tools and resources at home. This difference in family background may lead to inequalities in learning among young children even before school starts (OECD, 2019). The professional training and continuing education opportunities of preschool teachers in different regions and kindergartens are also significantly different, which will further aggravate the imbalance of artificial intelligence education resources (Holmes, Bialik & Fadel, 2019). The uneven allocation of artificial intelligence education resources will bring new inequalities and unfairness, deepening the gap in the quality of early childhood education in different regions.

Social Ethical, Privacy and Security Challenges

Stephen Hawking said, "The successful creation of artificial intelligence will be the biggest event in human history." Unfortunately, it may also be the last, unless we learn how to avoid the risks." With the widespread use of AI in various countries, many countries have begun to pay attention to the issues of discrimination and prejudice, loss of privacy, human rights violations and malicious use of AI. In the field of early childhood education, personal information and learning data of young children may be collected and analyzed in large quantities. If such data is improperly collected, stored or used, it will not only violate the privacy rights of children, but also may bring prejudice and discrimination against children. Parents and educators need to ensure that this data is collected and processed in accordance with privacy protection legislation and that appropriate measures are in place to protect young children's personal information from disclosure or misuse. In addition, over-reliance on artificial intelligence education tools may affect children's autonomous learning ability and interpersonal skills. Preschool teachers and parents need to balance the use of AI technology and traditional learning methods to reduce the negative impact of artificial intelligence on children's comprehensive development. In addition, the uneven distribution of AI education resources may exacerbate social inequality, allowing children who have access to and use advanced technologies to gain more development opportunities, while other children may be marginalized(Bostrom, & Yudkowsky, 2014).

Path Orientation for the Development of Infant AI Education

Improve the Mechanism: "Government - Enterprise - University - Kindergarten" Cooperation to Promote the Integration of Early Childhood Education and AI Technology

In the face of the challenges of the integration of artificial intelligence and early childhood education, it is necessary to establish a four-in-one cooperation mechanism of government, enterprise, university and kindergarten, and fully mobilize the advantages of government, enterprises, universities and kindergartens in order to accelerate the integration of artificial intelligence and early childhood education. The government plays an important role in this cooperation mechanism, and the government can formulate relevant policies and regulations, provide special financial support, tax incentives and other ways to encourage AI high-tech enterprises to participate in the integration and innovation research of early childhood education and AI. The United States, the United Kingdom and the European Union have successively issued policy documents on the integration of artificial intelligence and education, and China also attaches great importance to the development of intelligent education, the "New generation of artificial intelligence Development Plan" and the "Education Information 2.0 Action Plan" have been successively released, but the implementation and landing of the policy still need the continuous promotion of all parts. Enterprises have technical advantages, and the advantages of kindergartens and universities are the understanding of the characteristics of children's physical development and the mastery of education and teaching knowledge, principles and methods. AI high-tech enterprises give full play to their own technological advantages, while strengthening cooperation with universities and kindergartens, deeply integrate the knowledge, content and methods of education and teaching with AI technology, and develop educational resources, tools and platforms suitable for the physical and mental development characteristics of children is the only way for the integrated development of artificial intelligence and early childhood education.

Talent Training: Pre-Service Training and Post-Service Training to Improve Preschool Teachers' Artificial Intelligence Literacy

In January 2018, the Opinions of the CPC Central Committee and The State Council on Comprehensively Deepening the Reform of the Construction of Teachers in the New Era pointed out that by 2035, the goal of "teachers actively adapting to new technological changes such as informatization and artificial intelligence, and actively and effectively carrying out education and teaching" would be realized(KangYaqiong,2023). AI has the potential to innovate and transform the future of education in constructive ways, but simply adding AI technologies to educational practices will not guarantee the quality of educational outcomes. Artificial intelligence education is not only a simple integration of technology and products, but also a process and a way of thinking. Conversation with real people, actual participation and humanistic care are still valuable assets(CPC Central Committee and The State Council, 2018). Although AI weakens the role and function of teachers, it still cannot replace them. With the integration of artificial intelligence and early childhood education, the change of teaching model and teacher's role, preschool teachers must also improve their own artificial intelligence literacy.

Artificial intelligence literacy generally refers to the character and ability competent for social production and life and individual development in the era of intelligence, including knowledge, skills, abilities and ethical attitudes related to artificial intelligence(Li, 2021).In November 2022, the Ministry of Education issued the "Teacher Digital Literacy" education industry standard, which divides teacher digital literacy into five dimensions: digital

awareness, digital technology knowledge and skills, digital application, digital social responsibility, and professional development (The Ministry of Education of China, 2022). Different scholars have different ways to interpret artificial intelligence literacy, and the difference in connotation is not obvious. But it basically includes four aspects: knowing and understanding artificial intelligence, using and applying artificial intelligence, evaluating and creating artificial intelligence, and AI ethics. As the cornerstone of the national education system, preschool education must undertake the heavy responsibility of national rejuvenation and pay attention to personnel training. It is necessary to speed up the establishment of artificial intelligence education and training system, and conduct skills training for in-service teachers; It is also necessary to establish a training system for artificial intelligence education, modify and improve the training objectives of preschool teachers, build a pre-service training curriculum system for preschool teachers' artificial intelligence literacy, constantly update their own educational concepts, enrich their own educational knowledge, master new educational skills and methods, and improve their own artificial intelligence literacy.

Resource Guarantee: Policy Tilt and Resource Innovation to Promote the Balance of Resource Supply

Faced with the challenge of uneven distribution of artificial intelligence education resources caused by social and economic differences, we need to promote the balance of resource supply through policy inclination and innovation of educational resource forms. First, the government should formulate corresponding policies to provide policy guarantees and necessary financial support for kindergartens in under-resourced areas to improve infrastructure and purchase necessary AI educational equipment and software. For example, increasing the demand and supply of kindergartens in rural and remote areas to ensure the fairness of resource supply. At the same time, actively promote the "online" and "offline" multiple teaching models, and promote the innovative development of artificial intelligence education resources. "Offline", intelligent classrooms, campuses, training rooms, libraries and other learning places, as well as informal learning scenes such as subways, science and technology museums, are built to provide more flexible scenario-based and personalized learning services, and more intelligently adapt to the continuous migration and transformation of learners in multiple fragmented spatiotemporal scenes. Thus, a new learning ecology of "everyone can learn, everywhere can learn, and always can learn" is formed(Liu,et.al,2021), to build a diversified child artificial intelligence education material and ecological environment. "Online" to establish and improve the network of children's artificial intelligence education resources public service system, build a national children's artificial intelligence education resources service platform, promote the pooling and sharing of open resources, break the traditional barriers to the development and utilization of education resources, reduce the imbalance between regions, between kindergartens.

The "Education Informatization 2.0 Action Plan" released in April 2018 proposed that in order to promote the fair and balanced development of education and effectively improve the quality of education, it is necessary to actively promote "Internet + education". In addition, the plan also put forward the action plan of the network intelligence project, making full use of big data technology to collect and gather rich teaching, scientific research and cultural resources on the Internet, to provide massive and appropriate learning resources services for all types of schools at all levels and all learners(The Ministry of Education of China.(The Ministry of Education of China,2018). An effective monitoring and evaluation mechanism

should also be established to regularly check and evaluate the allocation and use of AI educational resources to ensure that resources are properly used and adjusted as needed. At the same time, it should also strengthen the cooperation between kindergartens and families and communities, encourage communities and families to participate in early childhood education, improve parents' awareness and participation in artificial intelligence education through parents' meetings, community activities and other forms, and jointly promote the high-quality development of early childhood education.

Privacy Protection: Improve Policies, Regulations and Technical Guarantees to Protect Children's Privacy and Safety

In the face of the social ethics and privacy protection of the application of artificial intelligence in early childhood education, countermeasures should be taken. First of all, improve the relevant policies and regulations to provide legal protection. We will strengthen research on legal, ethical and social issues related to artificial intelligence, and establish legal, regulatory and ethical frameworks to ensure the healthy development of artificial intelligence. [32] The norms and restrictions on the collection, storage, processing and use of personal information of young children in the field of education should be clearly defined. These regulations should be in line with international standards and ensure that the privacy rights of young children are fully respected and protected. UNESCO stresses that the development and application of artificial intelligence must respect and protect the right to privacy, eliminate discrimination, and ensure that all people can benefit equally from technological advances. Second, strengthen technical support. Educational institutions and technology providers should adopt data encryption and security to prevent data breaches and unauthorized access. At the same time, an effective monitoring and evaluation mechanism should be established, and any violation of privacy protection regulations should be severely punished. Preschool teachers, as the organizers and implementors of educational activities, should also improve their professional ethics, strengthen the concept of equality and fairness in education, and eliminate discrimination and inequality. Kindergarten teachers and parents also need to conduct privacy education for children and cultivate their awareness of protecting personal information. Through games and activities, teach young children how to safely use AI devices and understand potential risks and hidden dangers.

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