Development Trend and Thinking of Artificial Intelligence in Education

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***Abstract*—Artificial intelligence is a collection of information technologies based on big data and machine learning with intelligent capabilities. It integrates artificial intelligence into the field of education and uses key technologies and intelligent means in an intelligent education environment to optimize education development. The system promotes the synergy and integration of emerging intelligent technologies and the education industry. In general, the application of artificial intelligence in the field of education is constantly expanding and deepening, and the emergence of new concepts, new methods, and new ideas is bound to have a profound impact on the reform of the education industry.**

Keywords: Artificial Intelligence, Education, Trend

I. NTRODUCTION

From the conclusion of the "4th China-US Smart Education Conference" in 2019, the "integration and symbiosis" of artificial intelligence and education has become an inherent demand for transforming education, and it will also become an inevitable trend to build an integrated intelligent education framework system for production, learning and research [1]. Whether it is policy planning, industrial layout, or the innovative application of artificial intelligence's own technology, the academic community's discussions on artificial intelligence education mainly focus on three aspects: one is the impact of artificial intelligence on the reconstruction of the education ecosystem; the other is the rational promotion of artificial intelligence and education. The deep integration of industries; the third is to jointly empower the future with artificial intelligence and education [2].

Looking at China's current educational informatization construction practice, the potential of artificial intelligence technology in education is huge. Focusing on the integration of artificial intelligence and education, from education intelligence In the practice of technological innovation, human-machine collaboration, teaching and learning collaboration are advocated to promote the comprehensive and sustainable development of artificial intelligence technology[3]. At the same time, the rapid development of AI education enterprises has promoted the deep integration of AI and education. According to the report of the US Education Department, it is estimated that the AI in the US education will increase by 47.5% from 2017 to 2021, of which the "Ai + education" enterprises are expected to grow.

2. INTEGRATION ADVANTAGES OF ARTIFICIAL INTELLIGENCE AND EDUCATION

The distinguishing feature of artificial intelligence is the technology's intelligence, integrating artificial intelligence into the field of education to promote the intelligent development of the future learning ecosystem. Its advantages are reflected in three aspects. First, artificial intelligence provides protection for personalized learning in the field of education [4]. Judging from the development of artificial intelligence technology in recent years, especially in the fields of computer vision, computer speech recognition, natural language processing, etc., the application scope of artificial intelligence has been expanding, which has a profound impact on the education industry. For example, more and more intelligent facilities and equipment The application in educational practice is convenient to build a virtual reality situation that meets the needs of learners, and stimulates the learners' autonomous learning consciousness. In the application of the natural language intelligent guidance system, Professor Hu Xiangen emphasized that using natural language to start teaching dialogues with learners can Realize expectations-misunderstood customized dialogues, combined with learner feedback to optimize teaching content, and improve the quality of knowledge construction and internalization of students.

Second, artificial intelligence helps to promote immersive learning. Modern educational technology has given the unique application of multimedia Advantages, such as using VR, Internet of Things, artificial intelligence and other technologies to create gamification.These scenarios can meet the individual learning needs of learners. These intelligent technologies can create immersive media environments for learners according to their needs, and enhance learners' consciousness and participation, as shown in Figure 1. The virtual reality simulation learning environment developed by Mursion can meet the requirements of remote online learning and training, and create a realistic virtual learning environment for learners,

thereby saving training costs and improving the effectiveness of remote training.

Third, artificial intelligence has become an important way to solve educational reality problems. In recent years, with the development of VR technology, some wearable virtual reality devices have begun to be applied in the field of education and have a profound impact on the education industry. Some educational technology companies and financial investment institutions have started the widespread application of virtual reality technology To build a learning environment that meets the needs of learners' intelligence and meets the needs of learning [5]. In general, the innovation and application of technology in the field of artificial intelligence has injected vitality into education innovation, enriched the meaning and extension of education, and provided education reform Scientific guidance.

The Markets and Markets report shows that the global market for artificial intelligence education in 2017 was about $370 million.It is estimated that by 2023, the global market for AI education is expected to exceed US $3 billion 600 million, with a compound annual growth rate of about 47%.Another Global Market Insights report shows that the global market for artificial intelligence education is expected to exceed 60 in 2024.In the next ten years, the Asia Pacific region will become the fastest growing area of artificial intelligence education.The growth rate may exceed 50%.

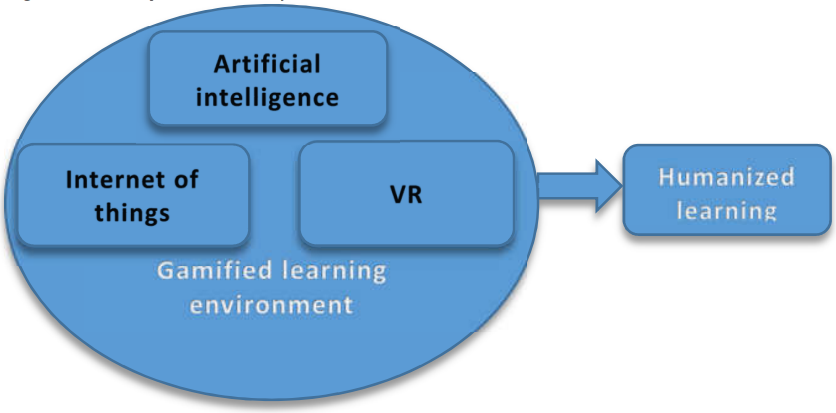

Figure 1.A model of artificial intelligence for immersive learning

3. Application Value of Artificial Intelligence in Education

Technological progress and innovation is an important manifestation of the development of artificial intelligence.In the current education field, modern education technology featuring artificial intelligence has realized the deep integration of artificial intelligence and the education industry, and has provided technology for seeking multi-dimensional innovation in the field of education. Support [6].

3.1 artificial intelligence enhances the learning experience of learners

In the process of learner learning experience, the application of artificial intelligence technology and equipment not only meets the diversified learning needs of learners, but also creates conditions for improving learning efficiency. For example, Professor Davidsen of the University of Bergen in Norway, with the help of serious games, To demonstrate the esoteric concepts in complex systems, making it easy for students to understand and apply. Similarly, Professor RitterGuth uses Unreal Tournament game software to integrate English writing tasks into it, allowing students to stimulate motivation and improve writing from the game creation situation. In recent years, some foreign university researchers have actively explored the fusion of virtual reality technology and educational games, and through technology innovation to break through the traditional teaching deficiency. For example, the learning game of virtual reality scenarios developed by Professor Johnson of the University of Arizona, allows students to experience The fun of scientific inquiry. In fact, virtual reality technology is an important application of artificial intelligence. It uses educational games to integrate scientific inquiry with structured games to facilitate students' independent thinking and cooperative exploration.

VR developed by Huayu Education Technology Company Chen Changjie Game software-101 Creators World, relying on cloud computingIt integrates big data and integrates VR with 2D and 3D material libraries to facilitate students to create different VR games through editors and stimulate students' imagination. The application of artificial intelligence technology in education is more for learners The impact of learning models, such as Professor Grant of the University of South Carolina, introduced STEM education to accept, integrate the network resources platform inside and outside the school, so that students can collect data related to learning from the platform, and carry out related scientific experiments. Application of these new technologies So that learners can focus on learning tasks and experience the fun of inquiry learning.

For example, Baidu brain uses AI technology to develop the four abilities of "seeing, listening, speaking and thinking", so as to produce good content and experience. Through intelligent big data analysis and intelligent base output, Baidu intelligent classroom helps regional education resources sharing and co construction, and enables education managers to understand the situation of teaching and learning in a timely manner. Baidu's educational brain is based on Baidu brain.Based on AI, big data and cloud computing, enabling education products and educational scenarios to provide users with quality content and intelligent service capability engine, it can be applied to many scenes from primary school to high school, such as student learning, teacher teaching, campus management and learning situation analysis.To meet the needs of teachers and students in preparing lessons, teaching, after-school, interaction between teachers and students,.2018 released Baidu education brain 3.0&qu ot in November of 2018.

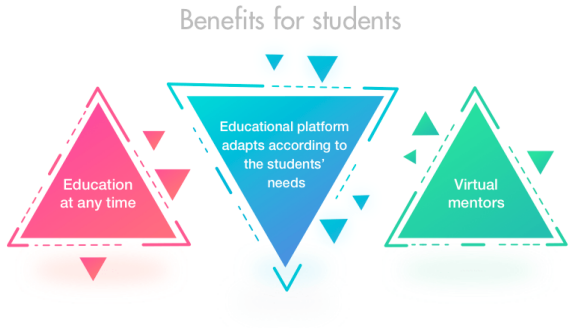

Figure 2. Artificial intelligence to benefit students[14]

3.2 Artificial intelligence assists teachers to improve teaching efficiency

The integration of artificial intelligence in the field of education not only provides learners with a personalized learning environment, but also sets up a good teaching support environment for teachers. Teachers use artificial intelligence technology to integrate education knowledge and data to facilitate the formulation of students' needs. Differentiated teaching environment suitable for students [7]. For example, Professor Spector of the University of Texas uses intelligent mentor system to integrate mentor resources into the complex pattern data matching algorithm, which can satisfy students to autonomously retrieve the corresponding mentors and start class learning. Technology can integrate the needs and learning habits of learners, and support students' personalized learning. In addition, in the application of artificial intelligence technology, teachers use artificial intelligence technology to analyze the learning trends and characteristics of learners, with the aid of computer-assisted teaching Functions to improve teaching efficiency, such as the introduction of an intelligent homework correction system and the introduction of a subject intelligent test system to test and statistics the student's learning situation, which facilitates the implementation of differentiated teaching.

China has already made efforts in the field of "AI+ education", such as Baidu, science education and many other enterprises. Among them, the school education was founded in 2015. It focuses on intelligent adaptive education in the field of intelligent personalized guidance in K12, and provides intelligent recommendation for both sides of the teaching. It provides an exclusive learning path. In recent years, it has developed an adaptive learning engine named squirrel AI, which takes deep learning algorithm and knowledge map as its core. Focusing on the individualized teaching of students, providing the best learning path for both sides of the teaching, has solved a great pain point in the current wisdom education, and provided a possibility for "teaching &q uot in accordance with aptitude". At present, the company has established the Joint Laboratory of artificial intelligence with the Stanford research Center (SRI), and the joint laboratory with the establishment of the Chinese Academy of Sciences automation.

3.3 Artificial intelligence promotes professional development of teachers

Based on the needs of teacher professional development, apply artificial intelligence technology to teacher professional education and training to solve the problem of teacher shortage [8-10]. In STEM practical teaching, teachers of traditional disciplines cannot meet the teaching requirements. Intelligent engineer education service system can provide teachers with rich science and technology and real project curriculum resources. These intelligent education achievements have entered the field of education in a "remote" and "virtual" way. The department uses the Internet to build STEM education-related training platforms to facilitate teachers to share and co-build teaching resources from online teaching and research, communication, and cooperation[10-12].

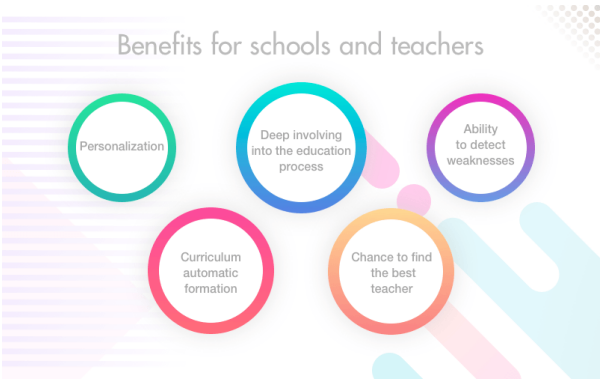

Figure 3. Artificial intelligence to benefit educators[14]

3.4 Artificial intelligence promotes accurate evaluation of education

Modern education technology based on big data, especially the development of artificial intelligence systems, has made useful explorations in the field of

education evaluation[13-14]. Some intelligent technology researchers have combined intelligence with the evaluation of stem education to develop intelligent and cross-domain knowledge integration. The evaluation system can make a rational evaluation of the learner's learning process, scientific thinking, scientific methods, etc. Similarly, in the education evaluation practice of stem, a teaching evaluation system based on the construction of a smart learning environment can meet the needs of multidisciplinary and multifield Evaluation needs, such as the information technology evaluation example developed by Professor Zheng Yonghe of Beijing Normal University, covering all aspects of the student's learning process, multi-dimensional evaluation of learners' data collection capabilities, learning behavior analysis, and academic performance, etc. Teaching provides technical support.

3.5 Artificial Intelligence Promotes the Scientific Development of Teaching Governance

The introduction of artificial intelligence technology in the field of education not only improves the level of education and teaching, but also provides technical support for educational decision-making and the rational allocation of educational resources. For example, the e-Portfolio learning system developed by the Simmons University of Texas and Concentric Sky, With the certificate and badge mechanism, the student's online learning process and academic performance are fully managed, and the learning incentive mechanism is formed through micro-certificate transcripts and digital badges. Similarly, in many universities in China, more and more artificial intelligence technologies It is applied to the construction of campus intelligent network to improve and enhance the campus education and living service environment, and provide convenience and safety for the majority of teachers and students. The inclusive advantages of education brought by artificial intelligence provide a balance and fairness for educational resources. Good application opportunity.

4. Application Prospects and Thoughts of Artificial Intelligence in Education

Judging from the current integration of artificial intelligence and the education industry, there are still some challenges. One is the ethical challenge. The informationization of education management brought by artificial intelligence may have an impact on the data security and privacy protection of teachers and students. The lack of ethical control mechanisms in the education field, and the comprehensive application of artificial intelligence also brings ethical differences. The second is a theoretical challenge. Artificial intelligence is based on the sharing of multi-form, multi-distribution, complexity, and massive heterogeneous educational resources, covering education, There are inevitably management difficulties in all aspects of teaching and learning. For example, some researchers believe that artificial intelligence places too much emphasis on human-computer interaction, teacher-student interaction, and how to avoid learner game addiction while improving the fun of educational games There is still an improper problem in the identification of educational game resources under the background of intelligent technology. In addition, in the combination of virtual and actual, and the construction of a new type of intelligent classroom with main and auxiliary functions, artificial intelligence and its synergistic functions need to be further resolved.

5. Conclusion

Artificial intelligence has brought greater opportunities for educational reform. From technological innovation and educational practices, we must grasp the commanding heights of artificial intelligence, restructure the educational ecological environment, and actively resolve many of the challenges it faces.

Acknowledgements

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