The integration design of artificial intelligence and normal students' Education

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Abstract. With the coming of the era of intelligence, the deep integration of artificial intelligence and normal education will become an important trend of education development. Normal students, as future teachers, are the key force to cultivate innovative talents in the era of intelligence. It is the current work and research focus to actively use artificial intelligence to improve the comprehensive quality of normal students. However, in the current rapid development of education informatization and intelligence, the development of normal education in China still faces four practical problems: the characteristics of normal students are not fully considered in teaching, and the quality of normal education needs to be improved; teachers' level of education informatization and intelligence need to be strengthened; lack of comprehensive understanding of students' personalized characteristics, and personalized teaching still needs efforts. Therefore, we try to build a deep integration framework of artificial intelligence and normal education, and explore the idea of using artificial intelligence technology to solve the four major problems of normal education development. Finally, combined with the design idea of the integration of artificial intelligence and normal education, this paper reflects on the problems that may be faced in the process of practice, and puts forward the corresponding solutions.

1. Introduction

Since 1956, the father of artificial intelligence, John McCarthy and others, put forward the concept of artificial intelligence (AI), pointing out that to make machines cognize, think and learn like people [1], artificial intelligence has been wildly sought after. However, in the 1970s and 1980s, due to the bottleneck of development, artificial intelligence began to encounter cold, and then it has been in a slow development stage. In recent years, with the rapid development of machine learning and deep learning algorithm, artificial intelligence has returned to people's vision again, causing a "boom of artificial intelligence". Artificial intelligence has also become the focus of all countries. China also issued the notice on the development plan of new generation artificial intelligence in July 2017 (The State Council, 2017). In August 2019, the Ministry of education of the People's Republic of China issued the outcome document of the UNESCO International Conference on artificial intelligence and education- Beijing Consensus: artificial intelligence and education.

With the continuous maturity of technology, artificial intelligence has been applied in the field of education, which has attracted the continuous attention of education researchers and practitioners. Wu Yonghe and others constructed the education system of "artificial intelligence + education" from the
three aspects of application form, technical structure and business trend. The purpose is to create an intelligent education environment of "everyone can learn, everywhere can learn, always can learn".innovate learning methods and teaching modes, and provide appropriate and personalized education for education participants, including teachers, students, parents and managers[2]. On the one hand, using artificial intelligence technology and data mining technology to track and monitor the related learning data of students to achieve the purpose of supporting personalized learning. On the other hand, educational artificial intelligence products are also emerging, such as interactive teaching materials, LearnSmart, Smart Books, intelligent educational resource production tools, etc., which have laid a solid foundation for the application of artificial intelligence in the field of education.

Generally speaking, the current integration of artificial intelligence and education has been widely studied and practiced in the field of basic education and higher education, and has made some achievements. However, in terms of normal education, according to the characteristics of normal education, the application of artificial intelligence for normal students’ education is still relatively lacking. But the application of artificial intelligence in normal students’ education is a very important factor for normal students both as students now and teachers in the future. It plays an important role in the current personal learning development and future career development, and it is also the necessary prerequisite and key factor to realize the modernization of education in China. At the same time, the combination of normal education and artificial intelligence has unlimited possibilities. With the advent of the era of intelligence, the deep integration of artificial intelligence and normal education will become one of the important forces to promote the development of education. Based on this, this paper attempts to build a deep integration framework of artificial intelligence and normal education, and discusses how to solve the four major problems in the development of normal education with the help of artificial intelligence technology, hoping to provide some reference for the innovation and development of normal education assisted by artificial intelligence.

2. Outstanding problems faced by normal education

2.1. Lack of teaching practice experience of normal students
At present, the general teaching practice experience of normal students is insufficient. The lack of practice opportunities and direct teaching opportunities for primary and secondary schools lead to the lack of understanding of primary and secondary education for normal students, which makes their own development goals and positioning unclear.

2.2. Outmoded curriculum in Normal Colleges
Most normal colleges' curriculum arrangement is not reasonable. For many years, the information technology related compulsory courses in normal colleges and universities have been mainly based on computer culture foundation and modern education technology, supplemented by some other elective subject. The content is old, and there is a lack of connection between each course, a lack of overall planning, and a lack of integration with specific subjects learned by students, which plays a limited role in upgrading the skills required by normal students in the intelligent era.

2.3. Lack of innovation in teaching methods
At present, the information technology courses in many normal universities still stay in the traditional teaching mode, which is mainly taught by teachers, and students passively accept the form of "indoctrination". The innovation of teaching mode is seriously lagging behind, which can not adapt to the training mode of talents in the information society.

2.4. Lack of independent learning of normal students
On the one hand, because normal students are used to the traditional teaching mode of indoctrination, they lack the habit of independent learning and active learning in information-based teaching and intelligent teaching. Moreover, they lack the habit of taking technology as a way to change their own
learning mode to realize their sustainable and comprehensive development, adapt to the future self-improvement and adapt to the future teaching work.

3. Integration framework of artificial intelligence and normal education

3.1. Basic principles of integration

3.1.1. Principle of subjectivity. In normal education, we should highlight the learning orientation and training goal orientation of normal students. All teaching activities should always focus on promoting the all-round development of normal students. The integration of artificial intelligence and normal education should always adhere to the subjectivity of students, so that technology can serve the future career needs of students. The application of artificial intelligence can provide massive learning resources to learners. Students can get rational knowledge by the personal experience opportunity provided by artificial intelligence, and also can get specific teaching experience they lack through the teaching interaction of robots, so as to improve their ability. AI emphasizes that every student is an active, developing and independent individual, and that every student has unlimited development potential. The application of artificial intelligence technology aims to fully tap its potential, mobilize its initiative, cultivate its cooperation and creativity, and establish a good channel for the interaction between teachers and students.

3.1.2. Principles of individualized education. The principle of individualized education refers to making corresponding teaching arrangements according to the individual characteristics of normal students, so as to stimulate students’ initiative and enthusiasm to construct learning and truly realize "teaching according to their aptitude".

3.2. Integrated framework design

With the development of technology and the coming of the intelligent era, artificial intelligence can effectively solve the problems existing in normal education, promote the innovative development of normal education, solve some difficulties in the development of normal education, and help the development of normal students. Based on the principles of subjectivity and individualized education, this study constructs the integration framework of artificial intelligence and normal education (see Figure 1).

Figure 1. Integrated framework

The deep integration of artificial intelligence and normal education lies in how to use artificial intelligence tools or means to solve the problems existing in the development of normal education and promote the new development of normal education in the era of intelligence. The integrated
framework takes the four problems existing in the development of normal education as the core, the artificial intelligence tools or means as the key, and uses the artificial intelligence technology to solve the four development problems one by one: using the data analysis technology of deep learning system to analyze the learning characteristics, providing the learning resources pertinently, promoting the independent learning ability of normal students; using the application of intelligent tutors to solve the problems of the lack of innovation in teachers' teaching methods and strengthen their professional level; to use the expert system to classify and plan the curriculum system of normal students to make the curriculum design more scientific and targeted, and to promote personalized teaching; to solve the problems of lack of practical experience of normal students by combining other artificial intelligence technologies such as intelligent robots.

3.2.1. To solve the problem of students' independent learning and improve the quality of learning. Artificial intelligence can help to analyze the data of learners, organize the content according to the data, and carry out intelligent push. This technology application is called deep learning system. Depending on the deep learning system, teachers can create teaching resources to meet the needs of curriculum design and students. First of all, the teaching courses system and the relevant data of students, such as the age of students, the intellectual development of students, and the psychological development of students, are introduced into the deep learning system. Then the algorithm in the system can read the relevant data of students through the engine and match the content. Finally, the system will find a new mode to generate the teaching content that meets the needs of students. In the aspect of learning group analysis and modeling, group collaborative learning has become a mainstream teaching strategy and learning participation form in the actual teaching process. In order to maximize the effectiveness of group learning, many researchers began to use algorithms to group learning. Conventional algorithms include I-minds, Group Formation Tool and TeamMaker [3]. The teaching resources designed by the deep learning system can fully consider the students' physical and mental characteristics and learning needs, which can promote the students' initiative in independent learning.

3.2.2. To solve the problem of the lack of practical teaching experience of normal students and improve the level of teaching practice specialization of normal students. It can make a special learning plan for students according to their interests, habits and learning needs [4]. Similarly, in the field of normal education, the intelligent tutor can also become a professional teacher who accompanies the normal students at any time and any place, and can also be a simulation student of normal students. Through the teaching of simulation students, specific teaching experience can be obtained. Through natural language processing, speech recognition technology and face recognition technology, intelligent tutors can not only play the role of teachers, help learners learn, but also play the role of students to help students gain teaching experience, so as to realize seamless docking before and after work. And it can track, record and analyze data in real time in this process, so as to realize the continuous optimization and upgrading of normal students themselves.

3.2.3. To solve the outmoded teaching methods and innovate teaching methods. Expert system is a kind of development of artificial intelligence, which combines the ability of computer to store professional knowledge and a set of rules, aiming to copy the decision-making process of human experts [5]. The expert system can accurately classify normal students and highlight personalized teaching. The expert system mainly imitates human experts through knowledge representation and intelligent reasoning, which can accurately classify students and provide scientific basis for individualized teaching in schools.
4. Possible problems and solutions in the implementation

4.1. There is a lack of top-level comprehensive design at the school level, and it is difficult for AI technology to be widely applied.

Although AI can better solve many problems faced by normal education at present, in the face of sudden changes, the school has not been fully prepared, which makes it difficult for AI technology to be implemented, and the four outstanding problems faced by normal education development whether can be effectively solved by artificial intelligence needs further verification. This reason includes the following three aspects: first, the colleges infrastructure is not perfect, many colleges are still in the construction of intelligent campus, many hardware and software equipment can not meet the requirements of artificial intelligence to promote normal education; second, the lack of teachers who master the teaching based on artificial intelligence. Third, there is no mature experience to learn. From a global perspective, the application of artificial intelligence in the field of education is just starting, while the application in the specific field of normal education is less. Based on the above reasons, first, the colleges should improve the software and hardware infrastructure construction of artificial intelligence environment. Second, the colleges should establish an artificial intelligence system that combines production, learning, research and application to meet the needs of normal education, and implement the application of artificial intelligence technology with the help of enterprises. Third, the colleges should deeply study the supporting role of artificial intelligence technology in the development of normal students, and provide sufficient basis for students’ personalized solutions.

4.2. At the teacher level, there are doubts about the application value and role relationship of artificial intelligence.

It is difficult to change the concept. Because the application of artificial intelligence in the field of education is just starting, teachers are confused about the application value and role relationship of artificial intelligence in normal education, which makes the teaching concept difficult to change. When AI enters the classroom, teachers have doubts about how to cooperate with machines to complete the teaching and who is the dominant power in the classroom. Therefore, teachers should change teaching ideas, practice actively, improve the ability of applying artificial intelligence, and strive to become a special education teacher following the pace of the times, so that their teaching practice can provide the most direct teaching demonstration for normal students. At the same time, they should actively seek solutions to normal education with artificial intelligence technology, improve the quality of teaching, and strengthen our professional level.

5. Conclusion

The deep integration of artificial intelligence and normal education is a long-term, complex and arduous task, which can be effective only when there are many kinds of cooperation. At the national level, we will accelerate the establishment of laws, regulations, ethical norms and policy systems for artificial intelligence to ensure its effective application in the field of normal education. For colleges, it is necessary to coordinate the allocation of artificial intelligence resources, establish an artificial intelligence resource sharing platform, open the channel of resource sharing, facilitate all teachers and students to understand and learn relevant knowledge and technology in time, and achieve the purpose of promoting the development of normal education. For social enterprises, they should establish a long-term cooperative relationship with the colleges, fully understand the needs and conditions of teachers and students, constantly innovate technology, grasp the key points of the application of AI technology in normal education, and improve the innovation ability of AI products.

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