The Reform and Practice of Educational Technology Major in the Age of Artificial Intelligence 2.0

Wei Xiao*, Mei Bie
Institute of Education, Changchun Normal University, Jilin 130032, China

*Corresponding author e-mail: 304883153@qq.com

Abstract. The current professional talent training program, curriculum setting, teaching method, etc., of educational technology major have failed to meet the requirements for the society gradually. There are three main aspects of the “AI+” Educational Technology professional reform of Changchun Normal University: knowledge, ability and the professional qualities. In the future, artificial intelligence will play an irreplaceable role in improving the quality of teaching and learning.

1. Introduction
The national artificial intelligence strategies have promoted the deep integration and development of “Artificial Intelligence + Education”. Especially in the field of basic education, the demand for teachers' educational technology ability has changed fundamentally. The current professional talent training program, curriculum setting, teaching method, etc., of educational technology major have failed to meet the requirements for the society gradually.

In recent years, Changchun Normal University has been exploring the education technology professional talent training system that meets the needs of the "Artificial Intelligence (AI) 2.0" era, and expecting to cultivate applied and compound talents of education technology major. Specifically, it starts from the three aspects of “To teach → To use → To build”, as shown in Fig1. “To teach” means the teaching ability of the AI course in the basic education stage; “To use” means the ability to use a variety of AI critical technologies; “To build” means the ability to design (build) innovative AI applications that can promote and even lead the development of basic education.

2. Background
2.1. The trend of “AI + Education” has been clarified from the policy orientations
The form of education always changes with the development of technology and the reform of production relations. The use of artificial intelligence (AI) to improve the quality of education and solve problems in the development of modern education has become widely recognized in the field of education. In
2016, the White House of the United States released the “National Artificial Intelligence Research and Development Strategic Plan”, which clearly proposed the use of artificial intelligence technology to “develop customized learning plans to challenge and engage each person based on their interests, abilities, and educational needs”. [1] In April 2018, the Ministry of Education of the People’s Republic of China also issued the "Innovative Action Plan for Artificial Intelligence in Institutions of Higher Education". The basic principle is to “persist in leading innovation”, accurately grasp the development trend of global artificial intelligence, and further optimize the scientific and technological innovation system in the field of artificial intelligence in higher education. [2]

2.2. Lack of a relatively complete "artificial intelligence + education" theory research and talent training case

A questionnaire survey about the graduates’ ability of competition has been carried out from 2017 to 2018. There are 120 people take part in this survey. All of them are graduated from the Educational Technology major, working as information technology teachers in primary or secondary school, teaching assistants in high school or college, postgraduate students, software companies and so on. One of the questions is what professional knowledge do you want to learn at present? As a multi-choice topic, the result shown in the Fig 2. Most of the participants (84.17 percent) chose the option of artificial intelligence. To a certain extent, it reflects the demand for professional related jobs.

Figure 2. The AI ability of educational technology major

How to cultivate and improve the level of artificial intelligence ability of the students major in education technology poses new challenges to the development of professional disciplines and the construction of talent training system. [3] At present, there are few studies on the training system of educational technology major in higher education to adapt to the development strategy of artificial intelligence.

3. The Reform and Practice

3.1. Constructing the “Artificial Intelligence + educational technology talents training system

There are three main aspects of the “AI +” Educational Technology professional talent training system, as shown in Table 1. These are the knowledge, ability and the professional qualities.

| Knowledge                          | The curriculum and teaching content of Artificial Intelligence                                                                 |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Ability                            | To integrate the teaching and learning methods of artificial intelligence in the teaching process, so that students have the knowledge-application ability. |
| Professional Qualities             | The students gradually form the concept and way of thinking that how to apply the artificial intelligence to solve educational technology problems. |

3.1.1. Discuss and revise the specialized training plan for education technology major. There is no curriculum and talent training requirements for artificial intelligence in the current 2016 edition of the Educational Technology professional training plan. The primary problem of this research is the positioning of artificial intelligence in the training program. [4] It incorporates artificial intelligence into
one of the talent training objectives, and regards artificial intelligence as one of the core competencies that graduates should possess.

On the one hand, add courses about the artificial intelligence and applications. The key issue lies in the screening of specific teaching content, the formulation of the syllabus, and the practice of basic education, while taking into account the current development of artificial intelligence.

On the other hand, the reform of professional curriculum teaching based on artificial intelligence is discussed. In recent years, we have been studying teaching modes reform such as flipping classroom, project-based learning, and mixed learning. In the future, we need to combine artificial intelligence technology with teaching methods to carry out teaching design and promote the deep learning of students.

3.1.2. Educational internship——exploration of artificial intelligence for basic education. In the educational internship, students are trained to implement intelligent education skills in teaching practice, and improve relevant knowledge and curriculum construction in artificial intelligence courses. It is necessary to strengthen the information technology knowledge, skills, application ability, information awareness and information ethics of students' integration inside and outside the classroom, and to integrate students' information literacy and artificial intelligence literacy into the comprehensive quality evaluation of students. [5]

3.1.3. School-enterprise cooperation - expanding artificial intelligence practice learning. With the existing faculty and research platform of the university, it may be too difficult to meet the talent training needs of higher-level practice for artificial intelligence. Some famous technology companies and enterprises at home and abroad compete to develop and apply educational intelligent products, which is also the driving force for promoting "artificial intelligence + education". [6] Look for IT companies with rich results in the field of “Artificial Intelligence + Basic Education” to jointly develop the future education.

In recent years, with the rapid development of technologies such as big data and deep learning, many well-known enterprises at home and abroad, such as Microsoft, Apple, Google, and IFlyTek, are developing Educational applications based on deep neural networks (DNN) and convolutional neural networks (CNN) technologies. [7] Through the high-quality products provided by the educational companies, especially the quality products in the basic education field, it can provide practical opportunities for the students to practice, to cultivate their artificial intelligence literacy; The AI experimental platform and API interface provided by enterprises could support the practical applications based on artificial intelligence.

3.2. The activity design and resource construction of curriculum

In fact, AI education should not be limited to formal school courses. Both primary and secondary schools and higher education institutions can offer a wide range of maker movement, programming activities, robotics education and a variety of educational activities. In these activities, we can infiltrate various forms of creative thinking, guide students to experience problem-solving process based on interdisciplinary knowledge, develop innovative technology application and invention, explore the laws of scientific phenomena and engineering practice, and achieve individual success. [8]

Based on the experience of artificial intelligence curriculum design and teaching programs at home and abroad, we makes an in-depth study on the positioning of the AI curriculum module and the design of specific teaching activities in higher education. Build a complete learning support system, collect, organize or make appropriate learning resources, and expand and construct resources from the basic AI knowledge, the reform of teaching mode and the application of artificial intelligence to teaching management.

3.3. Faculty cultivation

Our major pays attention to strengthen artificial intelligence teacher training, actively promote teachers to participate in teaching research and academic exchanges about the artificial intelligence education.
All the members are responsible for the overall design of the goal, the theoretical research of the teaching model, the curriculum reform design, the experimental teaching and so on. At the same time, we maintain the interaction and cooperation between each other.

3.4. Construction of the teaching environment
We have been striving to apply for national and Jilin Province funding support, to build artificial intelligence application laboratory and artificial intelligence innovation laboratory. On the one hand, the functional modules of AI products should be expanded to meet the teaching needs and the individual learning needs of students at different stages. On the other hand, we should strengthen the cooperation and guidance of AI experts and experts in the field of education, so as to start from the actual needs of education and explore the joint point between AI and education.

4. Conclusion
There are indeed many possibilities for Artificial Intelligence to improve learning and instruction. [9]

In the future education reform, artificial intelligence will play an irreplaceable role in improving the educational quality of teaching, innovating the training mode of talents, promoting personalized learning and lifelong learning, which needs the extensive attention of the government, school, enterprises and society. The development of artificial intelligence in education has made some achievements and influences, however the overall development is still in its infancy, still facing many difficulties. It is necessary to excavate the application value of artificial intelligence in the field of education, so that it can provide better services for education. [10]

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References
[1] Information on https://www.nitrd.gov/news/national_ai_rd_strategic_plan.aspx
[2] Information on http://www.cac.gov.cn/2018-04/11/c_1122663790.htm
[3] A. Chen, The significance of artificial intelligence development and the cultivation of future vocational education talent. Contemporary Vocational Education. 4 (2017) 11-15.
[4] G. Wu, From instrumental thinking to artificial intelligence thinking: the crisis of education technology and its transformation, Open Education Research. 2 (2018) 51-59.
[5] B. Q. Liu, Artificial intelligence constructs a new ecology of education informationization, China Education Newspaper. 6 (2018) 1-3.
[6] Y. H. Wu, B. W. Liu, X. L. Ma, Constructing an ecosystem of “Artificial Intelligence + Education”, Journal of Distance Education. 5 (2017) 27-39.
[7] R. Q. Bao, New investigation in teaching and learning transformation and open university 2.0 in artificial intelligence era, Journal of Distance Education. 4 (2018) 25-33.
[8] J. B. Zhang, L. Y. Ji, Artificial intelligence enhanced education or education for development of intelligence, Modern Distance Education Research. 2 (2018) 14-23.
[9] J. M. Spector, J. Du, Artificial Intelligence and the Future of Education: Big Promises - Bigger Challenges, Academics. 4 (2017) 257-265.
[10] X. M. Yang, H. Zhang, L. M. Guo, X. Q. Lin, X. L, The development predicament and breakthrough path of educational artificial intelligence, Modern Distance Education Research. 3 (2018) 30-38.