The Connotation Analysis and Path Exploration of Teacher Training Under the Background of Intelligent Era

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Abstract

With the advent of the intelligent era, the society put forward new requirements for the knowledge structure and ability of talents. As engineers of human soul, teachers have the responsibility to shoulder the great mission of the times. As a crucial means of teachers' professional development, teacher training is an important guarantee for education quality and talent training. By combing and analyzing the new characteristics of education in the intelligent era and its opportunities and challenges to teachers' professional quality, this paper puts forward the Countermeasures of teachers' training under the new situation, so as to improve teachers' professional quality and meet the new needs of talents in the intelligent era.

Key words: Intelligent era; Intelligent education; Teacher training; Teachers' professional quality

INTRODUCTION

The continuous progress of technology has led to great changes in the demand for talents in the market. In the era of intelligence, teachers are facing both great development opportunities and great challenges. The previous teacher training model, which focused on subject expertise, pedagogical theories, and educational teaching strategies, can no longer meet the new requirements for teachers' professional quality in the age of intelligence. Under the policy call of comprehensively building a high-quality, innovative and professional teaching force, and combined with the background of the times and the development trend of society, the new connotation and new ideas of teacher training in the intelligent era should be explored, in order to meet the new requirements of teachers' professional development in the context of the intelligent era and to implement the education that satisfies the people.

1. THE SIGNIFICANCE OF TEACHER TRAINING REFORM IN THE ERA OF INTELLIGENCE

Teacher training aims to meet the needs of students' all-round development, personalized development and full development. It is not only an effective means to realize the construction of high-quality, innovative and professional teaching force, but also an important way to meet the needs of teachers' work practice and professional growth. Teacher training under the background of intelligent era is also a professional training implemented to meet the social requirements for education, teachers and talent quality under the promotion of artificial intelligence, big data, cloud computing, the Internet of things and other technologies. It is obviously task-driven, targeted and is an organic part of teacher professional development. Currently, the state is increasing its support for teacher training, advances in information technology require constant updating of teacher training, and teachers themselves in this context are seeking further professional development because of changes in their work environment, work style, and other content.

1.1 Policy Calls, Teacher Training Is Facing Great Development Opportunities

In recent years, the state has increased its emphasis on teacher development and support for teacher training, so that effective progress has been made in this field.

In 2010, the National Medium and Long-Term Education Reform and Development Plan (2010-2020) stated, "Improve the training system, make a better cultivation planning, optimize the team structure, and improve the professional level and teaching ability of teachers. Cultivate a number of teaching masters and discipline leaders. "[1] Since then, policy documents to strengthen the construction of teaching force have been issued one after another. In 2018, the Action Plan for the Revitalization of Teacher Education (2018-2022) put forward clear requirements on teacher training as well as safeguarding the quality of teacher education, such as establishing relevant quality monitoring mechanisms and building a complete quality assurance system for teacher education. And encourage the full use of new technologies such as cloud computing, big data, virtual reality, artificial intelligence, etc; promote the construction and application of information-based teaching service platforms for teacher education, and promote the change of teaching methods mainly characterized by autonomy, cooperation and inquiry.[2]

The Fifth Plenary Session of the 19th CPC Central Committee clearly pointed out that China has shifted to a stage of high-quality development. The key to high-quality education development lies in building a high-quality teaching force. In order to achieve this goal, systematic and effective teacher training reform is needed. In this context, the state will continue to increase the attention and support for teacher training, and the reform of teacher training has an unprecedented huge impetus.

1.2 Technology-Driven, Teacher Training Is Facing New Requirements

At present, the rapid development of artificial intelligence technology has promoted the change of many industries and injected new life to the revolution and development of education, also, explored and formed new educational models such as "artificial intelligence + education" and "intelligent education".

In 2019, The Beijing Consensus on Artificial Intelligence and Education, released by UNESCO, stated that artificial intelligence should lead innovation in education and promote changes in education, teaching and learning methods.[3] In the same year, the report "Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development"stated that teachers need to be prepared for AI-driven education and must learn new digital skills to use AI in a pedagogical and meaningful way (Ren, Wan, & Feng, 2019). The future educational teaching tasks are accomplished by human teachers and artificial intelligence machines working together, so that teachers need to master the theories and methods of intelligent machines, select educational resources as well as educational technologies appropriately, analyze teaching problems in a timely manner, and collaborate with machines to complete teaching tasks together. The report further indicated the current situation and challenges of education and teachers' survival and development under the impetus of technology, which has provided directions for teacher training reform in the context of the intelligent era.

For education, the impact of information technology is very profound. It not only affects the technical aspects of education and teaching, such as the emergence of teaching media, the revolution of teaching methods, the change of teaching contents and the innovation of teaching modes, but also has a great impact on teachers and students in the educational situation. Take teachers for example, in the era of intelligence, the teaching content is no longer limited to books, and the teaching environment is no longer limited to school classrooms. Teachers can choose relevant courses anytime and anywhere according to their own characteristics of subject, interests, specialties and work needs. Self-directed learning and ubiquitous learning are becoming a major trend in teacher training (Deng & Zhong, 2020). However, the current concept, content and methods of teacher training can hardly adapt to the new requirements for talent specifications that the rapidly developing information technology asks, and teacher training asks new development requirements too.

1.3 Teacher Development, Professional Role Calling for Competence Enhancement

Teachers are engineers of human soul and transmitters of civilization. On the way of people's growth, they often encounter many good teachers. After many years, they can still recall the pictures of teachers teaching vigorously on the podium and patiently tutoring homework after class. This is the dialogue and communication between life and life that machines can not do. Teachers' mission is to teach and educate people. And they have an important impact on students' personality cultivation and personality development. What's more, teachers have rich professional knowledge, educational theories and teaching skills, which can provide all-round guidance for students' acquisition of knowledge, cultivation of ability and maintenance of mental health. Teachers' professional degree, moral level and accurate grasp of professional development trend are important factors affecting education quality and talent training

In the era of intelligence, teachers are no longer the exclusive owner of knowledge and single authority.

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[1] Outline of the National Medium- and Long-term Education Reform and Development Plan (2010-2020) [EB/OL]. http: //www. moe. gov. cn /srcsite/A01/s7048/201007/t20100729_171904. html

[2] Ministry of Education of the People's Republic of China. Action Plan for Revitalization of Teacher Education (2018-2022) [EB/OL]. http: //www. moe. gov. cn/srcsite/A10/s7034/201803/t20180323_331063. html

[3] UNESCO. The International Conference on Artificial Intelligence and Education, "Beijing Consensus - Artificial Intelligence and Education" [EB/OL]. http: //www. moe. gov. cn/jyb_xwfb/gzdt_gzdt/s5987/201908/ t20190828_396185. html

Students can acquire knowledge through learning at any time and place. The purpose of education is no longer to show teachers' knowledge reserve and ability level, but to inspire students to learn to think deeply. The professional role of teachers will also change. Teachers are no longer a single Indoctrinator of knowledge, but a promoter to encourage students to acquire the habit of thinking and studying. Looking at the current teacher training, there are still many problems. For example, in terms of training course, they often focus on the training of teachers' subject expertise and teaching ability. And they are mostly carried out in special and independent curriculum plates, such as subject professional knowledge, subject teaching strategies and methods, educational research methods, etc. which lack systematization and hierarchy, and the training contents are not well targeted (Zheng, 2011); In terms of training methods, they are mostly carried out through thematic learning, lecture training and other methods, which are relatively single in form and lack diversity and flexibility; In terms of training evaluation, it pays attention to hard index such as class hour records and the number of activities involved, but less to communication and interaction between training experts and trainees or among trainees. What's more, it ignores the needs and feedback of trainees in the training process, fails to diagnose the current situation of teachers' development in time, seldom to research and analyze teachers' needs, lacks evaluation scheme of scientific achievement and logistics guarantee of quality, and neglect follow-up tracking and continuous improvement of training.

Therefore, Teacher training in the context of the age of intelligence needs to be systematically reformed, in addition to subject expertise, subject teaching methods and basic education theories, teaching competency training; modern information technology, teaching techniques and arts need to be added accordingly so as to meet the needs of teachers' actual education and teaching.

2. OPPORTUNITIES AND CHALLENGES OF TEACHER TRAINING IN THE AGE OF INTELLIGENCE

People hold different views on the intelligent revolution and the intelligent era. On the one hand, in the process of human beings moving towards an intelligent society, the occupational structure will change significantly. With the emergence of unmanned bookstores、unmanned factories and unmanned drivers, repetitive and simple manual work will be gradually replaced by machines. So that while human beings have more and more free time, some people will also face the risk of unemployment. On the other hand, with the development of deep learning, cloud computing, big data, Internet of things and other technologies, intelligent robots will appear more and more frequently in people's daily life and work. People can use these technologies to assist learning and work and complete part of the mental work that originally only belonged to people (Cheng, 2019). The career type, work content and operation mode of intelligent society will change greatly. Therefore, when intelligence is combined with teacher training, it also shows some new opportunities and challenges.

2.1 Great Change in the Role of Teachers

In the past, the main duty of teachers was to "teach and solve problems", but with the advent of the intelligent era, the application of intelligent machines in the classroom will greatly change the mode of teachers' functions. Traditionally, teachers' work was characterized by the complexity of teaching and educating people. In the age of intelligence, with the in-depth implementation of education reform, the rapid changes in teaching technology and the continuous acceleration of knowledge updating, intelligent machines are good at data processing and recording, which can help teachers to complete part of the repetitive and simplistic work in teaching. Teaching and education are relatively separated, with machines taking on more teaching tasks and teachers concentrating on education work. So that teachers will have more time and energy to develop students' creative and aesthetic abilities, become the organizer, guide and supporter of students' learning process, solve the shortcomings of traditional education which focuses on knowledge and skills transfer instead of emotional education, and better carry out the responsibility of educating people.

In this context, teachers should shift more from the role of "teacher" to that of "educator"; always consider the ability to educate people as one of the core competencies of their professional development; insist on the dialectical unity between "teaching by word" and "teaching by example", "teaching" and "educating"; strictly implement the fundamental task of "establishing moral education" and devote to the overall development of students. In contrast, traditional teacher training focuses on the transmission of educational theory and professional knowledge, but relatively neglects the responsibility of teachers as educators to lead thoughts and develop morality.

2.2 Prominent Emotional Function of Education

In November 2019, the blue paper on "Artificial Intelligence + Education" released at the fifth "Future Education in the Era of Big Data" forum pointed out that "artificial intelligence will bring about the liberation of teachers' intellectual work, and teachers will be able to have more time and energy to care for students' hearts, spirits and happiness" (Yu, 2018). The era of intelligence is the era of human-machine coexistence and co-teaching. Machines can transmit information and solve problems instantly and efficiently, but it is difficult to achieve emotional resonance and exchange of ideas. At this point, the human advantage--emotional nature becomes

very important. The teacher of the future is not only a person with professional subject knowledge and excellent teaching skills, but also a person with rich emotions. As individual social animals, people have a strong need for connection and emotional communication, which requires teachers to have good social skills and empathy, to be able to guide students with a sincere and warm heart, and to take good care of them. Education in the age of intelligence places greater emphasis on teachers' Emotional edification or the interaction and cooperation of learning communities. Teachers' main task will change from providing professional theoretical knowledge to building a learning environment that helps students develop creativity and digital media literacy, and they will also take on more of a mentor and advisor role, providing students with opportunities to explore their own learning trajectory and future development, helping them to become a real person (Zhang, 2017).

2.3 The Intellectual Challenge of Disciplinary Integration

Teachers in the age of intelligence should be multi-talented. The school of the future is an open place, where teachers with specialized subject expertise and a large number of educational and teaching auxiliary machines and technological tools come together. The teacher is no longer an individual who performs teaching tasks independently, but is supported by a full range of team members to complete specific tasks (Shang, 2014). Teaching-assisting machines and technological tools will become a great helper for teachers' education and teaching. However, because machines can only operate according to established procedural rules and do not have the innovative ability and divergent thinking of people, intelligent machines cannot replace people, and even more people are needed in some parts of the process. "The operating post of the future will be more technical and professional, skilled jobs will gradually decrease, while the number of dynamic jobs will become more." (Sendele, 2015) In the age of intelligence, a large number of people with advanced professional knowledge and technical skills are needed, such as professionals who are proficient in the installation, operation, commissioning and maintenance of intellectual production systems. Therefore, this also puts forward higher requirements on the professional competence and quality of teachers. In addition, knowledge in the age of intelligence also reflects the characteristics of interdisciplinary and disciplinary integration, and the application of intelligent technology in the field of education is also a process of interdisciplinary integration and development, involving computer science, education, psychology, biology and other disciplines, which requires the understanding and analysis of the nature of the learning process from multiple fields (Liu, Du, Jiang, et al, 2018). Therefore, teachers not only need to master the professional theories and development trends of their own subject areas, but also need to have a multidisciplinary vision of knowledge, interdisciplinary thinking and ability to solve complex problems in education and teaching from multiple perspectives and fields.

2.4 Higher Requirements of Information Technology Capability

The era of intelligence is the era of information explosion that will produce a large amount of data. Faced with such a vast amount of data, how to understand, select, analyze and apply it will become a key ability. As General Secretary Xi Jinping pointed out, "the innovation and popularization of scientific and technological"are the two wings of innovative development. The development of science and technology has led to an industrial revolution, which is inseparable from education reform, and the implementation of education is inseparable from the updating and improvement of teacher training. Machines can help teachers record and collect a large amount of information from students, such as psychological changes in the classroom, analysis of test questions, feedback on homework completion, etc. Also, it can help teachers improve the quality and efficiency of education and teaching. At the same time, teachers are the main body of teaching and are also the users of teaching machines in the intelligent era. In the process of education and teaching, teachers and students jointly use a variety of technological devices to connect abstract thinking and concepts with concrete reality. In this process, teachers' role has changed, no longer as an exporter of knowledge, but as a guide of knowledge of the world that lead students to explore more (Wen, et al, 2016). Therefore, teachers need to master solid theoretical knowledge of using intelligent machines and know how to organically combine specific real-world problems with intelligent technologies; secondly, teachers should learn to appropriately select and use machines in conjunction with their work needs and provide timely feedback to machine developers on their needs and suggestions to help the evolution and development of machines.

2.5 The Prominence of Creative Thinking

In the age of intelligence, the emergence of machines will free humans from a large amount of repetitive, mechanized labor, and humans can devote more time and energy to more creative work, thus creativity will become a necessary quality for teachers. At the same time, education in the future society is future-oriented and what education should do is not to prepare for future careers, but to prepare people for lifelong learning and lifelong development. Teachers need to guide students to learn to think and to develop their critical spirit and creative abilities. However, as Ken Robinson mentioned in his speech "Schools Erase Creativity", traditional schooling emphasize the criticism of failing grades and the wrong answers written by students, standardized tests and standard answers, which is actually distancing people from creativity and from the process of forming

some original and valuable idea. The age of intelligence demands a stronger free flow of ideas and a creative mind of humans that can creatively generate multiple reflections on things. So that creativity has become a competency that teachers urgently need to expand and strengthen.

3. STRATEGIES FOR ENHANCING TEACHER TRAINING IN THE AGE OF INTELLIGENCE

Every revolution prompts humans to find new industries and fields instead of struggling and fighting for the same jobs in the inherent fields. The unpredictability of future society and the learning and evolutionary nature of machine have prompted humans to take precautions and think fully about the direction of education ([US] Oz., 2019). The in-depth development of intelligence gives teachers significant opportunities and challenges, and machines can facilitate teachers' teaching work, while intuition, imagination, creativity, compassion, curiosity, emotional communication and other unique human traits are not possessed by machines (Chen, 2018). In the age of intelligence, strengthening the cultivation of these human-specific qualities is an important path to promote the reform of teacher training and a key move to help teachers settle under such circumstance.

3.1 Strengthen Psychological Education and Guidance

In the age of intelligence, machines have freed teachers from tedious and repetitive work, allowing them to engage in more creative and emotional work. At the same time, as the fundamental task of China's current education, strengthening moral education and cultivate people is also the source of cultivation and development of students. Hence, it is more important for teachers to educate students with emotional edifying and moral cultivation in the age of intelligence, so that students can feel human-caring, emotional resonance and warmth of life in the mechanical environment of machine. Human beings are social animals with individual characteristics and have a strong need for connection. The teacher's voice to the students' hearts and the resonance of their thoughts is something that machines cannot do. People are more willing to engage in dialogue and communication with teachers, psychologists, and coaches than with machines. As a teacher, you should focus on listening to your students' hearts, capture their psychological trends and needs, and provide timely psychological counseling. Therefore, in the process of conducting teacher training, special systematic courses on educational psychology, mental health education, psychological counseling theory and skills, interpersonal communication and art should be set up to improve teachers' understanding of the laws of educational psychology, psychological development of personality and psychological counseling skills, and to enhance the humanistic and emotional nature of teacher training.

3.2 Build a Multi-Curriculum System

The role of teachers in the age of intelligence is diverse. Teachers are not only course teachers of single subject such as language and mathematics, but also counselors, soccer partners, guides of knowledge, and recorders of growth for students. Therefore, teachers' abilities should also be diversified. Teacher training in the age of intelligence should focus on building a diversified multidimensional curriculum system, oppose strategies of equalitarianism, and scientifically design training courses that combine teachers' interests, strengths and development needs. At the same time, experts and scholars in related fields should be invited to give regular academic lectures to explain the development and frontier knowledge of their disciplines, so as to guide teachers to develop the learning habit of paying attention to the development of subject and continuously seeking advancement, and then to develop into researchers and experts in their field of discipline. What's more, in addition to specialized theoretical courses, various forms of activity courses also should be explored to cultivate more new-mode of versatile teachers by organizing and conducting abundant practical activities in the curriculum.

3.3 Promote Data Competency

Data competency is the ability to collect、organize、analyze、use and create data and information. One of the cornerstones of the era of intelligence is big data technology, which provides great convenience for education and teaching by connecting countless sensors to achieve real-time data recording and transmission. Facing the new development situation, teachers should strengthen their data competency and have high data processing ability. In the process of teacher training, wide variety of research activities and seminars should be carried out, such as curriculum design, teaching resource development, micro-lesson design, research and management of learning platform, etc. Teachers should be organized to actively participate in various network technology training and become proficient in using data media and tools such as tablet PCs, cell phones and multimedia. Also, they should combine the concept and method of intelligent education, practical teaching and teaching technology training effectively. At the same time, a special teachers' big database ought to be established to collect and record teachers' information in various aspects such as teaching, research, management and training. And teachers are encouraged to analyze, understand and apply big data, as well as combine theoretical learning and practical operation organically under instruction, so as to realize the unity of knowledge and practice, and be accurately oriented to use the data properly when facing the big data flow.

3.4 Enhance Cultural Agility

Today's world is an era of globalization, informatization and diversification, where different cultures communicate, intertwine and collide with each other. Take the Ice Bucket Challenge for example, it was popular a few years ago and prevalent in the United States, China and other regions, but in India, where water resources are relatively scarce, this act is considered a waste of water. So we can find that there are big differences in the understanding of the same thing by people from different cultures. Therefore, as a teacher in the age of intelligence, one should have a global consciousness and international perspective. In the process of teacher training, teachers should be encouraged to participate in educational exchanges organized by different countries and regions, and actively engage in relevant international exchange activities to enhance their awareness and ability to participate in international cooperation; secondly, in addition to course contents such as professional theoretical knowledge, pedagogical theories and teaching strategies and methods, teachers should also be educated about national humanities, historical traditions and multiculturalism to enhance their understanding of multiculturalism. Moreover, in addition to professional theoretical knowledge and teaching strategies, teachers should also be educated in national humanities and historical traditions and multi-culture, so as to enhance their understanding of multiculturalism and learn to deal with intercultural issues.

3.5 Developing Lifelong Learning Capacity

The age of intelligence is an era changes with each passing day, and the special nature of teachers' roles determines that education should be future-oriented and professionalized with an attitude of lifelong learning. Therefore, teacher training in the context of the intelligent era should strengthen the cultivation of teachers' lifelong learning ability. First, teachers should be guided to clarify the connotation and methods of lifelong learning, encouraged to study professional knowledge and skills, expand their academic horizons and keep enriching their own knowledge reserve, so as to lead students' growth with excellent ability and humanistic concern; secondly, teachers should fulfill the practice of lifelong learning, be guided to learn to reflect on their own, summarize their educational experience in such introspection and improve their educational wisdom to realize the updating and optimization of their existing knowledge. Thirdly, the attitude of lifelong learning should be firmly established. Teachers in the intelligent era are confronted with endless new things and new problems, so that teacher training should cultivate teachers' awareness of problem solving as well as attitude of lifelong learning and encourage teachers to learn more and think more. After all, the future of education is uncertain, and teachers in it can make continuous improvement in the trend of the intelligent era only if they keep future-oriented and maintain an active attitude of exploration.

REFERENCES

[US] Oz. (2019). *The future of education: Educational changes in the era of artificial intelligence*. Mechanical Industry Press.

Chen, X. S. (2018). Rethinking the nature of education in the era of artificial intelligence. *Modern Educational Technology*, (1).

Cheng, S. M. (2019). Smart revolution and the reshaping of leisure concept. *Social Science Front*, (11), 12-19.

Deng, L., & Zhong, Y. (2020). Rethinking and reconstructing the ecology of teacher education in the age of intelligence. *Journal of Teacher Education, 7*(05), 1-10. DOI: 10. 13718/j. cnki. jsjy. 2020. 05. 001.

Liu, D. J, Du, J, Jiang, N., et al. (2018). The development trend of integrating artificial intelligence into school education. *Open Education Research*, (4), 33-42

Ministry of Education of the People's Republic of China. Action Plan for Revitalization of Teacher Education (2018-2022) [EB/OL]. http: //www. moe. gov. cn/srcsite/A10/ s7034/201803/t20180323_331063. html.

Outline of the National Medium- and Long-term Education Reform and Development Plan (2010-2020) [EB/OL]. http: //www. moe. gov. cn /srcsite/A01/s7048/201007/ t20100729_171904. html

Ren, Y. Q., Wan, K., & Feng, Y. C. (2019). Promoting sustainable development of artificial intelligence education--Interpretation and insights from the United Nations' Artificial Intelligence in Education: challenges and opportunities for sustainable development. *Modern Distance Education Research, 31*(05), 3-10.

Sendele (2015). *Industry 4. 0 - The Coming Fourth Industrial Revolutio* (p.47). Beijing: Machinery Industry Press.

Shang, J. J. (2014). Who moved my podium---Reengineering the role of teachers in the information technology environment. *China Education News*, 2014-7-16(4).

UNESCO. The International Conference on Artificial Intelligence and Education, "Beijing Consensus - Artificial Intelligence and Education" [EB/OL]. http: //www. moe. gov. cn/jyb_xwfb/gzdt_gzdt/s5987/201908/ t20190828 _396185. html

Wen, J. L., et al. (2016). *Virtual reality +: business and future of parallel worlds* (p.202). Beijing: CITIC Publishing Group.

Yu, S. Q. (2018). "Artificial Intelligence+ Education" Blue Book In-depth Interpretation [EB/OL]. http://人工智能c-fe. bnu. edu. cn/cgzs/xzwz//index. html. 2018-11-10.

Zhang, K. Y. (2017). Implications of the new media consortium horizon report: 2017 basic education edition for basic education in China. *Teacher Education Research, 30*(02), 41-48.

Zheng, Z. H. (2011). Problems in the development of teacher training courses - based on the perspective of course structure optimization. *Journal of Inner Mongolia Normal University (Education Science Edition)*, (10), 72-76.