

THE REORGANIZATION OF TEACHERS' ROLES IN THE CONTEXT OF "ARTIFICIAL INTELLIGENCE +"

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Abstract: Artificial Intelligence enabled classroom teaching is the core driving force of classroom reform in the era of information 2.0. In this process, how to understand the conflict between Artificial Intelligence and teacher's role and position the teacher's role in the new technology environment is an important basis for leading the deep integration of Artificial Intelligence and education and teaching. In this context, "man-machine collaboration" will be an important trend of future education. Artificial intelligence technology, with its application in the field of education of intelligent platform, intelligent tools, and intelligent services, has brought challenges and dilemmas to teachers' professional roles. As an assistant teacher and analyst in classroom teaching, artificial intelligence has greatly contributed to the high efficiency, accuracy, and diversity of teaching. Teachers should be the designers, decision makers and educators of classroom teaching, so as to promote the all-round development of students and make them the talents needed by the contemporary society.

Keywords: Artificial Intelligence; teacher; teachers' role; intelligent technology.

I. INTRODUCTION

"Artificial Intelligence"(AI), was first defined as "a machine with the ability to simulate learning or intelligent features that can be accurately described" [1]. With the in-depth application of artificial intelligence in various fields, some scholars get a further summary that artificial intelligence is the science of researching, developing theories, methods, technologies and application systems used to simulate and extend human intelligence [2]. "Artificial intelligence education" has already become an important trend of leading education reform and reshaping

education ecology. In July 2017, *the new generation of artificial intelligence development plan* issued by the State Council emphasized accelerating the innovation and application of artificial intelligence, and proposed intelligent education to promote the reform of talent training mode and teaching methods [3]. *The action plan of educational informatization 2.0* also mentioned that "intelligent environment has not only changed the way of teaching and learning, but also begun to deeply affect the concept, culture and ecology of education." [4] With the replacement of blackboard by screen, workbooks by mobile phone, test papers by database, teaching assistants by AI, "Will teachers be replaced?" and "Where should teachers go?" have gradually become an important issue that has to be answered and reflected in the "AI+" environment.

Artificial intelligence "reduces" the extension of the original teacher's professional ability, but also puts forward a more diversified and profound demand for its connotation [5]. In March 2019, the United Nations Educational, scientific and Cultural Organization issued *Artificial Intelligence in Education: challenges and opportunities for sustainable development*, which mentioned that one of the goals of artificial intelligence education is to improve learning, that is, to promote the continuous development of human intelligence. How to undertake this new responsibility, and then fit the professional role of teachers under the "AI +" environment, is an important fulcrum to promote the development of intelligent education and the integration of artificial intelligence and education for a teacher. Based on the challenge to teachers in the "AI+" environment, this paper attempts to clarify the growth and transformation of teachers' functions in the process of AI empowerment education from the perspectives of "what do technology can be" and "what do teachers can be", so as to explore the roles of AI and teachers in the "AI+" environment.

II. THE REPLACEMENT AND CHALLENGE OF ARTIFICIAL INTELLIGENCE TO TEACHERS

A. Intelligent platform: a competitor with classroom and campus

The construction of intelligent environment, including intelligent education platform and intelligent classroom, creates conditions for AI technology to go deep into daily teaching. Not only that, the " post-figurative culture " phenomenon brought by the wide and diverse knowledge presentation forms in the intelligent environment has overturned the unequal relationship between teachers and students in the traditional teaching environment, and any individual, group or even country no longer enjoys the monopoly of knowledge .

Time	Documents
July 2017	<i>The new generation of artificial intelligence</i>
April 2018	<i>The action plan of educational informatization 2.0</i>
March 2019	<i>Artificial Intelligence in Education: challenges and opportunities for</i>

TABLE I. DOCUMENTS RELATED TO AI EDUCATION

The construction of intelligent environment, including intelligent education platform and intelligent classroom, creates conditions for AI technology to go deep into daily teaching. Not only that, the " post-figurative culture " phenomenon brought by the wide and diverse knowledge presentation forms in the intelligent environment has overturned the unequal relationship between teachers and students in the traditional teaching environment, and any individual, group or even country no longer enjoys the monopoly of knowledge [6]. Not only are the large-scale open courses, high-quality online resources compete for students with the traditional classroom, but also fragmented learning resources and informal learning space provide students with a large amount of knowledge. Back to the classroom, under the traditional teaching environment, teachers' experience in knowledge, equipment and other aspects is obviously superior to that of students, which makes

the classroom inevitable to escape the shackles of "Teacher centered" teaching mode. Teachers are "knowledge monopolists", textbooks and teaching reference books are the only "sources of knowledge", and students only need to accept and internalize knowledge unconditionally and without reflection. The most important thing that can be provided the by classroom under the Artificial Intelligence is knowledge and methods. The role of teacher as a " Knowledge instigator" in the past will undoubtedly be replaced by Artificial Intelligence which can collect more information and resources.

B. Intelligent tools: a competitor with pen and paper and Computing

As an extension of human intelligence, Artificial Intelligence has the characteristics of "irresistible" in speed, storage, calculation, standardization and so on. Its deep learning technology based on big data mining is the most typical. Artificial Intelligence can not only be used as a database and resource base for learners to choose and extract, but also as an intelligent robot that can interact with students in a complex way. It can not only be used as a teacher for "teaching", but also as a "student" for in-depth learning, so as to understand, comprehend and analyze students to a certain extent, and then provides effective support to student. Based on the big data technology, the diagnosis and intervention based on Artificial Intelligence can not only cover all academic data and evaluation results of students as much as possible, to carry out diversified and comprehensive learning analysis and diagnosis, but also surpass the limited knowledge background and recognition preference of individuals, to carry out objective learning diagnosis and personalized analysis. For example, the learning analysis technology supported by big data can not only clearly present the characteristics of students' knowledge, behavior mode, learning style and other characteristics of learners, but also carry out process monitoring and big data analysis in the learning process of learners, classify and intervene according to the cognitive level and ability level presented by learners, so as to meet the development needs of different students.

In addition, photo search, intelligent marking, text image recognition and other intelligent technologies also greatly optimize the efficiency of classroom teaching and learning. The empowerment of Artificial Intelligence makes education more efficient, fast and accurate.

C. Intelligent service: a competitor with teachers and teaching

In the 1950s, computer assisted instruction has been booming, which includes the research and exploration of realizing intelligent and personalized teaching. In 1973, intelligent tutoring system (ITS) was proposed to make artificial intelligence as an intelligent teacher / intelligent assistant to guide and help students learn. Up to now, the development and research of virtual teachers and virtual assistants are not rare, and their practical effects have been verified in a wide range of applications.

At the same time, the shortening of knowledge half-life and the accelerating of information updating speed make the difference between hard knowledge and soft knowledge appear gradually. Hard knowledge is considered to be knowledge that has been confirmed by experts and accepted by the public and is not easy to change, while soft knowledge is considered to be knowledge that is not stable and easy to replace or modify or even transfer. In the traditional classroom teaching system, hard knowledge accounts for a large proportion, but with the rapid development of knowledge networking and intelligent technology, more and more hard knowledge does not need to be taught and memorized, instead they are stored in the network platform, resource base, intelligent robot and other places, and learners can acquire, analyze, process and apply them according to their needs. In other words, memory, recitation and other low-level abilities will gradually be replaced by Information Technology and Artificial Intelligence, and the teaching of such hard knowledge will no longer be the main goal of modern classroom. The classroom in the "artificial intelligence +" environment calls for the teaching of soft knowledge and the cultivation of high-level ability, that is, to promote the

development of students' personality and the cultivation of innovation ability.

III. COEXISTENCE AND COOPERATION BETWEEN ARTIFICIAL INTELLIGENCE AND TEACHERS

According to the data system of Oxford University and Citibank, the BBC forecasts the "elimination rate" of 365 occupations in 2040: 98.5% for typists and 97.6% for Accountants musicians are 4.5%, while teachers are only 0.4%. Some scholars have explained this: professional occupations oriented to repetitive labor, step-by-step and procedural operation have a high elimination rate, while those occupations with high requirements for creative aesthetics, social communication ability and empathy have a low elimination rate. The basic reason for the low elimination rate of teachers' profession lies in the irreplaceable "internal regulations" of teachers' profession. Therefore, under the environment of "AI+", human-computer cooperation will be an inevitable trend. Artificial intelligence technology simplifies complex work and liberates teachers from tedious work. At the same time, teachers should also have the corresponding literacy to cooperate with intelligent technology, complete teaching work with high quality and efficiency, and effectively meet the needs of their own development.

The progress of technology has freed teachers from some heavy tasks. As some scholars have pointed out, AI can easily accomplish a lot of "things that need to be done repeatedly, information collection, data accumulation, processing and analysis." With the help of artificial intelligence technology, it is inevitable that teaching efficiency will be greatly improved.

1) Assistant-teacher

In the development of new classroom teaching modes, such as flipped classroom and blended learning, artificial intelligence just eliminates the heaviest work of teachers. Before class, AI can assist or replace teachers to provide teaching content and manage teaching process. In class, AI can provide the best conditions for the "student-centered" teaching mode. On the basis of providing abundant

learning resources, it can timely detect and diagnose students' learning performance, and provide immediate feedback, so as to ensure teachers in class to get the efficient interaction with students; after class, AI can play multiple roles such as assistant teacher, learning partner, consultant, etc., and interact with learners, assist personalized teaching and learning, accompany and detect learners' learning progress and learning situation in real time. For example, the virtual teacher of Quben school in Tokyo, Japan, helps students better deal with the obstacles encountered in the learning process, effectively improves the learning effect and improves the learning efficiency of students through real-time understanding and feedback of students' learning situation and effective cooperation with traditional teachers.

2) *Analyst*

On January 7, 2020, the Ministry of Education issued the evaluation system of China's college entrance examination and the explanation of the evaluation system of China's college entrance examination, aiming to change the single evaluation mode of "only score theory" in the past, which is bound to be achieved without the education and teaching evaluation enabled by artificial intelligence.

On the one hand, the traditional education and teaching evaluation can be based on fewer data, relatively fixed access channels, and a single evaluation method, while the intelligent education evaluation based on big data can not only widely absorb data from all parties, but also support different evaluation standards based on different purposes and learning scenarios. The promotion of education evaluation block chain technology also makes the learning data documentary more real and detailed, the evaluators can gather and process the data according to the specific evaluation needs, so as to achieve a more comprehensive and reliable evaluation of students. On the other hand, the learning analysis technology based on big data makes personalized and autonomous learning possible, which changes the situation that all students in traditional teaching have the same learning materials and the same learning pace, Artificial intelligence can evaluate and predict students according to their historical learning data which include classroom

performance and pre class learning, and then classify students according to their different characteristics in the learning process, provide students with visual reports, and intelligently recommend the most suitable learning content for students to choose.

B. Teacher's role and division of labor

1) Designer

Educational informatization 2.0 action plan puts forward that "we should explore the construction of a new environment of ubiquitous, flexible and intelligent education and teaching". Artificial intelligence technology provides sufficient technical support for the transformation of classroom informatization and intelligence. With the help of artificial intelligence, mobile Internet technology, cloud computing and other new technologies, it is a new job for teachers to redesign and present the learning space and environment in the intelligent environment, and then change the traditional teaching methods and the interaction mode between teachers and students, and support the teaching mode supported by new technologies, teachers should have the quality of artificial intelligence. They should not only be able to recognize and understand the positive role of artificial intelligence technology in education, but also be able to effectively combine the existing conditions, try innovative solutions of "artificial intelligence +" education and explore the integration path of artificial intelligence and education. At the same time, they should carry out the exploration of artificial intelligence education together with other educators, and actively seek organization and development, and become new teaching plan has become the explorer and leader of teaching reform in the "AI +" environment.

2) decision maker

Computer scientist Grady Butcher pointed out that computer software systems can enhance human intelligence, but they cannot replace human judgment (decision-making) Coincidentally, Li Kaifu also mentioned that "artificial intelligence relies on algorithms to transform knowledge and meaning, education

and human nature into machine codes of '0' and '1', and provide people with learning programs, and teachers are the people who choose this program".

IV. CONCLUSION

The wide application of Artificial Intelligence is changing people's current and future learning methods. "AI +" education should pay more attention to people's all-round development, cold technology can promote the improvement of teaching efficiency, and teachers' literacy can promote the cultivation of students' character. It can be found that part of the teaching professional characteristics of artificial intelligence instead of teachers are the aspects that teachers are in the AI +" era and need to change actively or passively in order to meet the development direction of the era and the goal of talent training. At the same time, the new professional roles and responsibilities of teachers under the "AI +" environment should become the direction of teachers' efforts to develop their own professional characteristics. Furthermore, the future education should be a kind of "human-computer symbiosis" education. The collaboration and cooperation between artificial intelligence and teachers will be inevitable. Teachers should also reflect on the relationship between technology and people, constantly develop their own professional quality, and clarify their own existence value.

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