

The Application of Artificial Intelligence in Foreign Language Teaching

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Abstract—With the continuous development of big data and cloud computing, artificial intelligence technology plays an important role in education. Traditional foreign language teaching can't satisfy learners' individualized, innovative and cooperative learning style. The mode supported by artificial intelligence brings opportunities and challenges to foreign language teaching. This paper analyzes the deep integration of artificial intelligence and foreign language teaching, and then from the modeling of foreign language learners and teachers under the artificial intelligence environment, further analyzes the application of artificial intelligence in foreign language teaching, and forecasts the development of artificial intelligence in the future. The deep integration of artificial intelligence technology in education improves the quality and effectiveness of foreign language teaching.

Keyword: *artificial intelligence, foreign language, teaching model*

I. INTRODUCTION

With the rapid development of neural network and brain science, artificial intelligence (AI) has become the focus of people's attention in recent years. The concept was first proposed at the Dartmouth conference in 1956, and was formally established as a discipline, after three highs and three lows. In 1997, the AI "dark blue" developed by IBM defeated the human chess champion. In March 2016, AlphaGo, developed by Google, beat Li Shishi, who has won the world championship for many times, with a 4:1 advantage. Since then, AI has been active in academic research, industry development and capital market.

Artificial intelligence takes intelligence as the core technology, integrates with big data, cloud computing and other technologies, and provides direction for future education development. In the white paper on the development of artificial intelligence^[1] released in 2018, it was mentioned that educational intelligence will become the development direction in the field of education, and artificial intelligence will lead to profound changes in education philosophy and education ecology. At present, major developed countries in the world are accelerating the innovation of education and teaching, actively developing new educational products and promoting the innovation of education and teaching. In April 2018, the action plan for AI innovation in colleges and universities^[2] proposed a new talent training mode in the future. To add "AI + X" composite professional training, many colleges and universities also began to establish AI colleges

and related majors. Under the background of the integration of artificial intelligence and education, foreign language teaching is also facing new opportunities and challenges.

The traditional recorder and repeater in foreign language teaching are replaced by intelligent devices such as computers and mobile phones. Foreign language learning mode has also changed from traditional follow-up reading, correction to human-computer interaction, artificial intelligence testing and other alternatives. Personalized learning, ubiquitous learning, collaborative learning, in-depth learning and other learning modes have also undergone major changes. As a result, foreign language teaching has also changed accordingly. Intelligent teaching and artificial intelligence teaching have brought new opportunities to foreign language teaching.

II. THE INTEGRATION OF ARTIFICIAL INTELLIGENCE AND FOREIGN LANGUAGE TEACHING

With the change of educational technology, the teaching strategy also changes, but no matter how the technology changes, the cultivation of students' core literacy will not change. In foreign language teaching, listening, speaking, reading, writing and other foreign language skills training should always be given priority to. Traditional foreign language teaching often consumes a lot of manpower to cooperate in the training of foreign language skills. However, with the development and application of artificial intelligence technology, a large number of programs can be introduced into foreign language teaching for auxiliary training. In addition, in the aspect of learning situation analysis and evaluation of students' learning process and performance, big data statistical methods can also be used to simplify teachers' simplicity and efficiency repetitive work. Foreign language teachers can use artificial intelligence to carry out oral assessment, network for writing assessment, grading reading, rain class, cloud ink blue class, Chinese university MOOC class and other platforms to carry out online teaching. On these intelligent platforms, teachers can carry out intelligent learning analysis and intelligent teaching evaluation. Students' learning data can be visualized in the background. Teachers can monitor students' learning behavior. Learning evaluation is no longer subjective, but the objectivity of big data analysis.

With the support of artificial intelligence, classroom teaching has changed a lot. For example, flipped classroom, micro class teaching, online teaching and intelligent classroom

are all built on the basis of this mode, which are all teaching products in the era of artificial intelligence. In this way, the use of artificial intelligence system can not only improve the automation and depth of students in the learning process, but also improve the labor intensity of teachers in the process of teaching students. Obviously, the content of courses supported by AI is more diversified and in-depth than traditional courses. At the same time, students are imperceptibly carrying out mobile, fragmented and intelligent learning. After class, including before and after class, students can carry out this kind of informal learning at will and anytime, anywhere. In the learning process, students will also have a better understanding of their own interest points, so as to improve their learning autonomy and sense of responsibility.

With the growing maturity of artificial intelligence research, "intelligent learning" and "deep learning" have been given new connotation. Intelligent learning is based on constructivism, hybrid learning and modern teaching and learning theory, integrating augmented reality, cloud computing, mobile communication, big data and other advanced information technology, and enhanced digital learning [3]. Deep learning can simulate the learning process of human brain through neural network to abstract a large number of real world data. At present, the typical deep

learning models include recurrent neural networks (RNN), convolution neural networks (CNN), and deep belief networks (DBN). Because RNN is mostly used to process time series, it is widely used in oral training, oral testing and other aspects [4].

III. MODELING OF FOREIGN LANGUAGE LEARNERS AND TEACHERS IN THE CONTEXT OF ARTIFICIAL INTELLIGENCE

Big data and cloud computing provide a favorable guarantee for AI technology, and also provide a new path and method for foreign language teaching reform. The deep integration of artificial intelligence and big data, the construction of ecological teaching mode, help students to update their English learning concept, content and method, stimulate students' interest in learning language, and then improve the effect of English learning [5]. According to the view of educational ecology, teaching activity is an organic whole. Therefore, the ecological foreign language teaching mode should include teaching resources, teaching environment, learners, teachers, as well as the activities of learners and teachers. With the support of artificial intelligence technology, foreign language learners, teachers and teaching activities form a foreign language teaching mode in an intelligent environment, as shown in Figure 1.

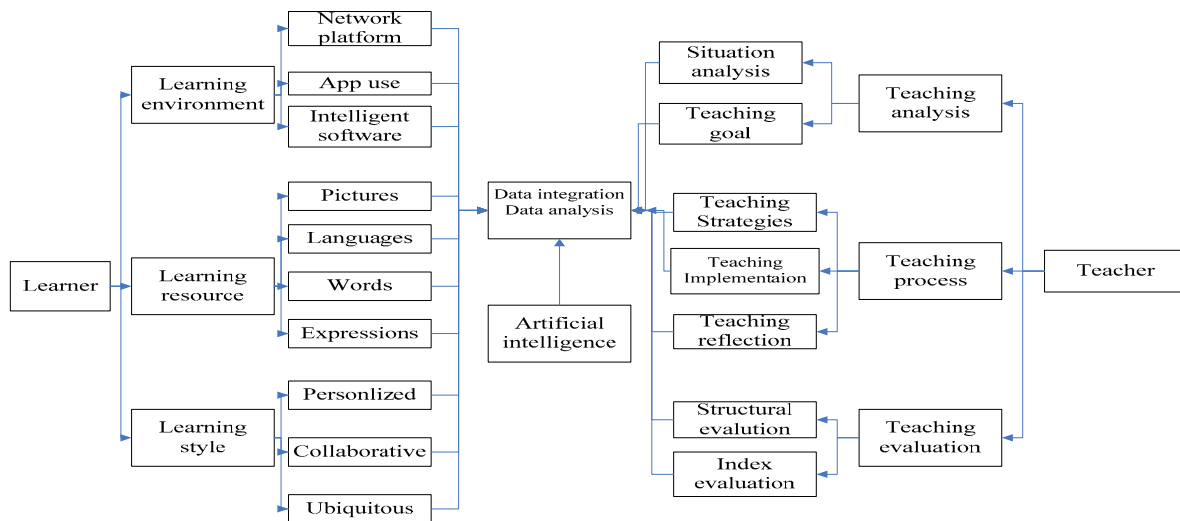


Figure 1 Modeling of foreign language learners and teachers under artificial intelligence

In Figure 1, AI can record and analyze the historical data of learners for data mining, and integrate the data through deep learning of machines for further analysis and research. Specifically, learners provide rich learning resources, such as pictures, languages, words, expressions, etc., through learning environment, network platform, APP use, intelligent software, etc., to provide technical and resource support for personalized, collaborative and ubiquitous learning. Due to the particularity of foreign language learning activities, learners will leave a lot of learning data on the network platform. With the continuous maturity of big data analysis and cloud computing technology, artificial intelligence can make in-depth learning through data

mining and machine, accurately draw the learners' foreign language learning ability. Through this learner modeling, the teacher further analyzes the intelligence learning situation, makes the teaching goal, and carries on the effective teaching strategy and the teaching implementation process relying on the artificial intelligence platform.

In addition, the massive data provided by artificial intelligence can also provide accurate evaluation for teaching and learning. On the basis of the combination of structural evaluation and index evaluation, the whole teaching ecology is dynamically evaluated, and reference is provided for the next

round of teaching and learning. The theory of multiple intelligences points out that different learning individuals lead to different cognitive styles and cognitive levels, and different learning starting points. Therefore, the dynamic evaluation data of students' learning effect "can be mined and deeply analyzed by recording and analyzing learning historical data, and intervene according to data analysis results, so as to evaluate learning process and predict future performance and identify potential problems "[6]. At the same time, the evaluation results can help teachers to reflect on teaching activities and design teaching on the weak links of students' learning. Finally, we can use artificial intelligence to supervise the whole teaching process, and carry out structural evaluation and index evaluation of teaching activities, and feed back to the teaching and learning terminals of teachers and students, so as to promote the construction of the whole ecological teaching activities scientifically and effectively. Artificial intelligence plays a decisive role in the whole teaching process (including the formulation of teaching objectives, the implementation of teaching strategies, learning and process evaluation, etc.). Artificial intelligence makes the teaching process no longer a closed system, but an open-loop, spiraling upward trend.

IV. ARTIFICIAL INTELLIGENCE AND THE FUTURE TREND OF FOREIGN LANGUAGE TEACHING

Big data analysis, cloud computing and the Internet of things provide ideas for foreign language teaching reform. In the future teaching, the deep integration of artificial intelligence and foreign language teaching will be a kind of normalization. Artificial intelligence promotes the accuracy and individuation of foreign language learning in foreign language teaching. The innovation of VR visual teaching, situational teaching, immersion learning and other teaching methods has improved the learners' interest in learning language and deepened the reform of foreign language teaching. Artificial intelligence brings new connotation and significance to foreign language teaching in the future. How to improve learners' language application ability of listening, speaking, reading, writing and translating with the support of artificial intelligence? How to obtain large-scale and high-quality data, how to construct more effective ecological model of learners and teachers, how to seek theoretical support for artificial intelligence in foreign language teaching, how to use big data analysis, cloud computing, upgrade intelligent teaching system, and how to achieve the comprehensive improvement of teaching effect and students' language learning ability.

V. SUMMARY

Artificial intelligence plays an important role in foreign language teaching. It is an urgent need for foreign language teaching reform to speed up the development of the deep integration of artificial intelligence and foreign language teaching. In order to improve the quality of foreign language teaching, we should innovate the training mode of foreign language talents, upgrade the technical means and build the

mode of foreign language teaching and learning with artificial intelligence. At present, the application of artificial intelligence is still in the primary stage. Through continuous upgrading of technical means and deep integration of teaching, it will be able to innovate foreign language teaching mode and promote the high-quality development of foreign language teaching.

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