English Education in the Era of Artificial Intelligence in China: Opportunities and Challenges

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Abstract— Driven by globalization and technological development, English education in China is facing unprecedented challenges and opportunities. In recent years, discussions on the future development of English education have been heating up. How artificial intelligence and English education will coexist and influence each other has become a hot topic in the education community. This paper analyzes this issue from multiple perspectives and explores the opportunities and challenges of English education in China in the era of artificial intelligence.

Keywords— artificial intelligence, challenges, English education in China, opportunities

I. INTRODUCTION

Artificial intelligence is not a new science. As early as 1956, John McCarthy and others began to hold a meeting at Dartmouth College in the United States to discuss "how to use machines to simulate human intelligence". At the meeting, the concept of "artificial intelligence" was proposed, marking the birth of the discipline of artificial intelligence. After more than 60 years of development, artificial intelligence has made significant progress. Since 2010, the rise of deep learning and big data has brought about an explosion of artificial intelligence. In particular, in March 2016, the artificial intelligence system AlphaGo played against the world Go champion Lee Sedol and eventually won, bringing the scientific term "artificial intelligence" into the public eye (Hua, Chen & Sun, 2017, p.27).

Artificial intelligence is not only dominant in Go games, but has also been widely used in news, finance, medical care, home and other fields. All walks of life are actively exploring the use of artificial intelligence technology to solve industry problems, and education is no

exception. The increasingly mature artificial intelligence and English teaching are deeply integrated. On the one hand, intelligent technology has expanded the space for English learning, changed the English learning paradigm, and promoted the transformation and upgrading of the English education model; on the other hand, it has subverted the traditional English education model and impacted the traditional college English teacher profession, making college English teachers face an unprecedented role crisis. At the same time, it has also brought some other negative effects. How artificial intelligence and English education will coexist and influence each other has become a hot topic in the education community.

II. ENGLISH EDUCATION IN CHINA CALLING FOR THE ARTIFICIAL INTELLIGENCE SUPPORT

In China, the efficiency of English teaching is not high. The effect of students learning English is more reflected in their test scores, while improving English application ability is the original intention of the general public to learn English.

The low English communication ability of students is a major problem in China's current English teaching. Many people spend several years or even more than ten years learning English, but their English application ability has not yet reached a practical level. "Dumb" English learning is widely criticized. Under the new situation of globalization and internationalization, the reform of English teaching is imminent. We must use the increasingly mature artificial intelligence to solve the dilemma of poor teaching quality and effect in the process of English teaching, adapt to the needs of personalized talent training, and let technology serve education. Through the deep integration of artificial intelligence and English education and teaching, we can innovate English teaching models, teaching methods, and learning methods, and truly promote the reform of English teaching.

In fact, English teaching has always been closely linked to the development and application of technology, and language learning has always benefited greatly from new technologies. From the early phonograph that played standard English pronunciation, to the application of wireless broadcasting in distance learning and the expansion of teaching scale, then to the reel-to-reel and cassette recorders that can perform standard pronunciation and record learners' pronunciation for repeated comparison with the original sound, technologies dramatically facilitated the early English learning. Later, the advanced technologies, such as the language laboratories that created a rich teaching environment for English teaching, televisions that supported English television teaching, and video recorders that became a source of audio-visual learning and modern multimedia computers and networks, all have played a pivotal role in English teaching and have played a positive role in promoting the development of English teaching as well (Hu & Ji, 2015, p.116). Precisely because English learning is closely linked to technology, the first audio-visual education departments in many Chinese universities appeared in the foreign language departments. The development of technology has provided great support for students to learn English, and every teacher and student has felt the convenience that technology has brought to English learning.

Obviously, the rapid development of new technologies has led to major changes in the teaching and learning environment, which in turn has led to changes in the way people learn (Wang & Zhu, 2015, p.30). Language is the most effective means for humans to communicate and obtain information. Machine translation, natural language understanding, and speech recognition technologies in the field of artificial intelligence are all closely related to language learning. Currently, China's world-leading artificial intelligence speech recognition has an accuracy rate of over 97% and a very fast response speed. Machines can already understand human language and give timely feedback. Applying speech recognition technology to English learning can effectively support learners in listening and speaking practice. With its key technological advantages, artificial intelligence is gradually showing its prowess in the fields of personalized learning, gamified learning, and situational cognition, providing new technical support for educational reform that cannot be replaced by existing technologies.

III. THE DEVELOPMENT ADVANTAGES OF ENGLISH EDUCATION IN THE ERA OF ARTIFICIAL INTELLIGENCE IN CHINA

The application of artificial intelligence technology in English education is mainly reflected in two aspects: one is intelligent assisted teaching based on machine learning, and the other is online evaluation and feedback using natural language processing technology. Artificial intelligence technology has not only changed the way of teaching and learning English, but also promoted the transformation and upgrading of the English education model.

3.1 Normalization of ubiquitous English learning

In traditional English teaching, students are often placed in a passive, externally controlled, and competitive closed classroom, mechanically accepting knowledge imparted by teachers. Students generally feel that learning is boring, which is not conducive to the cultivation of creative talents (Han, Tian & Yuan, 2012, p.70). In the artificial intelligence environment, with the rapid development of information technology, people's ways of obtaining and using English education resources are becoming more and more diverse and convenient. English tool platforms use mobile terminals or PC segments to provide functions such as memorizing words, looking up words, and language translation. English course platforms

mainly provide comprehensive and systematic online language learning resources in a real-time interactive way. The Chinese University English MOOC platform provides a ubiquitous English learning space for teachers and students to share resources and interact with each other. Intelligent language learning products such as intelligent voice assessment can evaluate, diagnose and correct English pronunciation, and intelligent review engines can use big data analysis technology to intelligently review essays, effectively improving language learning efficiency.

In short, artificial intelligence technology makes ubiquitous learning the norm. Ubiquitous learning means that anyone can learn without being restricted by time, space, form and method, that is, at any time, any place, with any device, and in any way, and enjoy ubiquitous learning services. English learning transcends the limitations of physical space and can be conducted not only in traditional classrooms but also in online classrooms. English knowledge comes not only from English teachers and textbooks, but also from ubiquitous artificial intelligence devices. For example, the conversational AI language model represented by ChatGPT can answer user questions anytime and anywhere, building a more active language learning environment for foreign language learners and providing a richer language learning experience. The diversified supply of English education services has enriched the way of learning English and created an English learning environment where "everyone can learn, learn everywhere, and learn at any time." Thanks to artificial intelligence, students have changed from passive recipients of knowledge and experience to autonomous learners with the power to make learning decisions.

3.2 Intelligentization of English education

Smart education is a new educational ecology in the era of artificial intelligence. It relies on artificial intelligence technology to build a smart education ecosystem (smart teaching, smart management, smart evaluation, smart scientific research and smart services) to promote the wisdom cultivation and sustainable development of education stakeholders (students, teachers, parents, managers, the public, etc.) (Yang, 2014, p.30). The combination of artificial intelligence technology and education and teaching is quietly happening. Building smart classrooms and implementing smart education is the general trend. The concept of smart education brings new atmosphere to English education and promotes the intelligent development of English education.

With the application of intelligent technology, we can build a smart learning environment for English education and realize the organic integration of physical education environment, virtual network education environment and social education environment (An & Zhao, 2016, p.30) . At the same time, by using big data and learning analysis technology, we can record the English learning process in real time, intelligently analyze English learning data, customize and push English learning resources, and timely evaluate the English learning effect, so as to realize intelligent decision-making and diversified evaluation of English education. It can be seen that ubiquitous intelligent learning, three-dimensional intelligent teaching, diversified intelligent evaluation, and visualized intelligent management have become the new direction and new pursuit of English education.

3.3 Customization of English learning and teaching

For a long time, English teaching has been mainly based on the class teaching system, providing the same teaching content to all teaching objects, that is, using the same teaching methods and arranging the same teaching tasks to impart English knowledge and skills. This model has achieved the scale of English education to a certain extent, but has neglected the individualization of English talent training.

With the support of intelligent education technology, foreign language learners can customize learning resources according to their own learning interests and learning needs, such as oral, listening, vocabulary, grammar, reading, writing and other single skill training. They can also use the generated personal learning data for self-reflection, timely adjust learning plans and methods, and carry out personalized learning. At the same time, intelligent technology can also accurately identify the learning needs, learning preferences, cognitive levels and other characteristics of foreign language learners, and push personalized foreign language learning resources in a targeted manner, so as to realize the transformation of foreign language education resources from supply-oriented to demand-oriented.

For foreign language teachers, the original experience-

based teaching decisions are static and often have lags. Big data technology can monitor, deeply mine and intelligently analyze English teaching data in real time, accurately grasp the English learning situation of class groups and individual students, and prompt English teachers to continuously adjust teaching strategies, optimize teaching models, and intelligently intervene in the English learning process, so as to implement scientific decision-making and precise teaching. Artificial intelligence technology provides scientific educational decisions for English educators and customized educational services for English learners, changing the extensive education model and realizing the true meaning of "teaching students in accordance with their aptitude".

3.3 Personalization of English assessment

Traditional language assessments have obvious shortcomings and lack flexibility in terms of unified scoring standards, personalized feedback, assessment content and format. However, language assessment systems with the help of artificial intelligence can provide learners with a tailored assessment experience. The system can create exclusive assessment content and difficulty for each person based on their language level, learning goals and interests (Aljanabi, 2023) . Using learners' assessment results, artificial intelligence can accurately identify their weak points in language learning and provide personalized learning suggestions, helping learners to quickly improve their language skills. In addition, the system can dynamically adjust the assessment content and difficulty based on learners' learning progress and feedback. This means that each learner can learn at their own pace without worrying about whether they can keep up or fall behind the preset course progress.

At the same time, compared with traditional assessments, the artificial intelligence language assessment system has shown excellent adaptability and can run on a variety of devices and platforms, such as computers, mobile phones and tablets. This gives learners the freedom to take language assessments at any time and any place, greatly enhancing the flexibility and convenience of learning.

3.4 Realization of native language learning environment

The essence of language learning is communication, which is to provide a communication tool. At present, the assessment of English oral ability pays more and more attention to students' actual ability to use English. However, in the actual English learning process, there is a lack of an environment for communication in English, which is also an important reason why many Chinese English learners have poor learning results. The process of language learning is a process of repeated imitation until proficiency, a process of "practice makes perfect". This is the case for mother tongue learning and English learning. By building a native language learning environment, learners' interest in speaking can be stimulated, and learners can learn English better and achieve the goal of free communication in English.

So, how to create a native English learning environment? The emergence of educational robots provides support for building an English learning environment. Educational robots have the ability to move and can follow learners like playmates. They can actively and timely interact with learners through daily language, creating a continuous and natural English use environment, and combining education with entertainment (Chen, Li & Hua, 2016, p.6). Robots will not only replace human physical labor, but will also increasingly replace human mental labor.

Educational robots can push appropriate English audio-visual materials such as cartoons, movies or English songs within the learner's cognitive level range according to the learner's gender, age, learning interest and cognitive level. Through data tracking, it can determine whether the student is interested in the current learning content, and then determine whether to switch to further in-depth learning and extended learning. Learners are influenced by the English language environment and its language rhythm, forming regular and appropriate language stimulation. After watching more English dialogues, they will naturally imitate and follow. English language ability will be improved imperceptibly. Educational robots can also provide learners with rich English dialogue scenes. During the dialogue process, the robot can give vocabulary prompts in time by "observing" the learner's performance and guide the learner to complete the basic dialogue. Through the form of human-computer interactive dialogue, it provides learners with opportunities to practice speaking, helps alleviate the embarrassment of talking with real people, and

enhances the fun of English learning in the process of effective interaction. Furthermore, educational robots can intelligently identify learners' emotions. When learners feel learning difficulties, they can motivate them by strengthening emotional communication, such as "Your pronunciation has improved today", so that learners can feel the support of their learning partners and stimulate their interest in learning. In a relaxed and harmonious English communication atmosphere, practicing oral English with intelligent companion robots can reduce learners' fear and anxiety, allowing learners to speak English fluently like their mother tongue (Hua, Chen & Sun, 2017, p.28).

3.5 Equalization of English education

The imbalance of educational resources is a major factor affecting educational equity and a major "bottleneck" restricting educational development. In the past, high-quality foreign language education resources were often concentrated in China's eastern region, urban areas, and key schools. The imbalanced distribution of foreign language education resources between regions, urban and rural areas, and schools will inevitably lead to unfair foreign language education. Technologies such as the Internet, artificial intelligence, and big data can break through time and space limitations, break down regional barriers, promote the rational flow of high-quality foreign language education resources, and enhance the openness and sharing of foreign language education.

The changes brought about by artificial intelligence have made English education more equitable. With the help of intelligent terminal devices, people can access high-quality English education resources anytime and anywhere, and even connect to international high-end education resources. Through online English education platforms, high-quality English courses can be shared and an English learning community can be established. Technologies such as the Internet, artificial intelligence, and big data can break through time and space limitations, break regional barriers, promote the rational flow of high-quality English education resources , and enhance the openness and sharing of English education. The opening and sharing of English education resources are conducive to optimizing the allocation of English education resources, promoting fairness in English education, and improving the quality of English education.

IV. THE CHALLENGES OF ENGLISH EDUCATION IN THE ERA OF ARTIFICIAL INTELLIGENCE IN CHINA

The role of artificial intelligence development in promoting English teaching models is mainly reflected in the construction of massive teaching resources, the strengthening of new learning methods, and the integration of inside and outside the classroom. However, there is still a gap between the development of artificial intelligence and the innovation of teaching and leaning models. It also brings the following potential challenges.

4.1 Challenges of the traditional role of English teachers

Artificial intelligence is subverting the traditional English education model and impacting the traditional English teaching profession, making English teachers face an unprecedented role crisis. Florian Znaniecki pointed out in his book *The Social Role of Intellectuals* (2000) that teachers are "knowledge disseminators" in the academic type of the intellectual role classification framework. role. Teachers have always been considered the embodiment of knowledge, with the mission of spreading knowledge. Teachers have the right to speak because they have knowledge, and have become "Knowledge authority". Therefore, in the traditional concept of English education, teachers are the possessors and transmitters of English knowledge and are the authoritative source for students to acquire English knowledge. However, today's college students are the "natives" of the information age. Information technology has not only changed their lifestyles and entertainment methods, but also changed the way they acquire knowledge and understand the world. They can search for a large amount of English education resources through more intelligent carriers or tools such as computers, mobile phones, and smart robots, and complete a full set of English learning activities such as course learning, communication and discussion, homework and examinations through online education platforms, thereby realizing the construction of English knowledge.

As English educators, English teachers should adapt to the development of artificial intelligence with a positive and open mind, break the traditional teaching model, attach importance to the learning and use of artificial intelligence technology, and take the challenge of artificial intelligence

as an opportunity for transformation and development. English teachers should be good at integrating classroom teaching with online teaching, integrating paper teaching materials with digital resources, integrating teacher evaluation with machine evaluation, allowing language intelligence technology to assist English teaching research, freeing themselves from mechanical and repetitive affairs, and having more time and energy to engage in intelligent and creative work, such as focusing on cultivating students' understanding, creativity, imagination and research learning ability. It is certain that artificial intelligence will not completely replace foreign language teachers, but in the future, most teachers who do not understand, are not familiar with, and cannot use artificial intelligence technology will be eliminated. Therefore, foreign language teachers must first become learners of intelligent technology, learn and apply new technologies such as artificial intelligence well, improve the ability of human-machine coexistence and human-machine mutual assistance, and promote the coordinated development of artificial intelligence and foreign language teaching.

4.2 Impact on the traditional English skills' cultivation

Artificial intelligence reshapes the concept, content and practice of English education, bringing important challenges to English education. The traditional concept of English proficiency mainly includes four aspects: listening, speaking, reading and writing, but in the era of artificial intelligence, this concept may need to be expanded and redefined. For example, writing ability may shift from emphasizing language accuracy to emphasizing critical thinking ability, and also include communicative language ability, cross-cultural communication ability, interaction ability, innovative thinking ability, etc. Second language acquisition theory also faces the possibility of reconstruction. For example, interaction theory used to emphasize teacher-student interaction and peer interaction, but now it is necessary to consider the impact of human-computer interaction on language acquisition; situational theory needs to be expanded to virtual reality and artificial intelligence environments; research on language transfer also needs to cover the impact of artificial intelligence tools, etc.

4.3 Weakening of critical thinking ability of English learners

The artificial intelligence corpus stores a large amount of information, which facilitates our acquisition of knowledge. However, if we rely too much on it, it will also lead to students being satisfied with ready-made answers, lacking problem awareness and critical spirit, and encouraging students to be lazy in seeking knowledge (Zhong, Shang & Wang, 2023, p.21). In addition, the quality of information in the corpus is also mixed. If it is not screened, it will mislead students. Therefore, teachers should teach students to think and innovate, and cultivate critical thinking and innovative thinking. In the process of foreign language teaching, language teaching and thinking cultivation are equally important. University foreign language teachers can take advantage of artificial intelligence products such as ChatGPT in foreign language skills training, reduce the proportion of basic skills teaching in foreign language classes, introduce more critical thinking training, and focus on the discussion and learning of humanities knowledge such as culture and history and interdisciplinary knowledge (Zhong, Shang & Wang, 2023, p.6). Only by maintaining rationality and objectivity can we give full play to the positive role of artificial intelligence technology in promoting students' learning and growth, and better deal with potential risks.

4.4 Questions about the accuracy and reliability of language assessment

Although language assessment with the help of artificial intelligence has many advantages, there are also some disadvantages to overcome and threats to be resolved. First, despite the continuous progress of technologies such as speech recognition and natural language processing, there are still problems of misrecognition and misinterpretation, which may affect students' learning effects and experience. In addition, the language understanding and processing capabilities of artificial intelligence systems have not yet fully reached human levels, such as understanding humor, sarcasm or cultural references, so misunderstandings or errors may occur in certain contexts, affecting the accuracy of the assessment (Son, 2018). At the same time, language is deeply influenced by culture, and artificial intelligence systems may not be able to fully understand and interpret language expressions in a specific cultural context, resulting in biased assessment results, especially for specific slang,

colloquialisms and expressions with rich cultural connotations. Therefore, when English teachers use artificial intelligence technology for evaluation and feedback, they need to be cautious about the results and avoid relying too much on technical judgment.

4.5 Risk of data leakage and misuse

When artificial intelligence is applied in English education, such as intelligent speech recognition and natural language processing, it is often necessary to collect and process a large amount of student voice and text data. These data not only contain students' learning outcomes, but may also reveal students' personal habits, opinions, and even emotional states, which may cause some privacy and security issues. In particular, there is a risk of leakage and abuse during data storage and transmission, and assessment data may also be abused or misused (Hao et al., 2024). We need to ensure the privacy and security of these data.

V. CONCLUSION

In short, in the context of artificial intelligence, China's digital teaching reform of English education is facing unprecedented opportunities and challenges. With the help of artificial intelligence technology, education can achieve a higher level of personalization and intelligence, and provide students with richer and more convenient learning resources and learning paths. However, this process is also accompanied by challenges such as data privacy leakage, over-reliance on technology, and uneven distribution of educational resources. This requires the joint efforts of the education community, the technology community, and policymakers to formulate reasonable data protection policies, balance the educational value of technology and interpersonal communication, and promote the fair distribution of educational resources. Only in this way can we ensure that English digital education based on artificial intelligence truly benefits a large number of students and promote the sustainable development and innovation of English education.

In the era of artificial intelligence, education has been given a new mission, with new characteristics and functions, and it also calls for the transformation and reshaping of the role of teachers. Teachers should pay more attention to exploration, communication, cooperation, reflection and mutual integration in professional development (Son, 2018),

actively change their concepts, reposition themselves, and turn crises into opportunities.

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