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Artificial Intelligence in ELT/L

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Abstract— *The rapid advancement of Artificial Intelligence (AI) has revolutionized various sectors, with education emerging as a significant beneficiary. Since the introduction of ChatGPT, the potential and challenges of GAI application in education have been widely discussed (Feng et al., 2023). This literature review explores the integration of AI in English language teaching (ELT), focusing on its applications, benefits, challenges, and future directions. By synthesizing recent research, this paper aims to provide a comprehensive overview of how AI is transforming ELT, offering insights for educators, researchers, and policymakers. The review highlights the potential of AI to enhance teaching efficacy, personalize learning experiences, and address the diverse needs ofEnglish language learners. However, it also underscores the need for careful implementation to mitigate challenges such as technological dependence and data security. This paper concludes with recommendations for future research and practice, emphasizing the importance of ethical considerations and cross-cultural approaches in AI-driven ELT.*

Keywords— ***Artificial Intelligence (AI), English Language Teaching (ELT), English language learning.***

I. INTRODUCTION

English serves as a cornerstone in global employment, commercial markets, tourism, academic discourse, and international connectivity (Lan et al., 2020). Mastery of the English language necessitates proficiency in speaking, listening, reading, and writing (Grabe & Stoller, 2002). However, empirical studies have shown that learners often face multiple challenges in English language learning, including limited exposure to English outside the classroom, insufficient content knowledge reserves, irregularities in English spelling rules (Ulicheva et al., 2018) and anxiety due to the fear of making mistakes in front of peers (Cumming et al., 2018). Artificial intelligence, as a computer system that mimics human intelligence with the ability to learn, understand, and memorize human language (Xiaohong & Yanzheng, 2021), provides a new path to alleviate the above challenges.

Existing research shows that AI has demonstrated multidimensional support in language teaching and learning: both for specific language skills, such as assisting with reading comprehension (Xu et al., 2019), training language skills through machine repetition (Kim, 2019), and correcting English pronunciation (Noviyanti, 2020), and for a wider range of teaching and learning activities, including automated review, real-time feedback, and the ability to learn and memorize human language (Xiaohong & Yanzheng, 2021) including automated marking, real-time feedback, adaptive learning experiences, and pedagogical prediction (Pokrivčáková, 2019). With the popularization of AI in education, it has become an important issue for educators to explore in-depth the mechanisms that support the teaching and learning of English for non-native English speakers. This need is also echoed by the academic community.

There are significant limitations in current research:

(1) most AI reviews in the field of education do not focus specifically on English language teaching (e.g., Crompton et al., 2020; Zawacki-Richter et al., 2019);

(2) they cover multilingual learning in general without anchoring on English;

(3) the research targets mostly ignore adult learners, and the studies are not focused on English language teaching

and learning (e.g., Yang & Kyun, 2022). Based on this, this study aims to respond to the call from the academic community to fill the existing gaps through a systematic review; to present the current status of AI applications in English language teaching and learning, to provide educational practitioners with references for teaching strategies, and to assist them in integrating AI tools with language skill development; and to reveal the challenges and limitations oftechnology applications, and to provide a theoretical basis for educational administrators and researchers to identify the future direction of research.

II. AI AND ELT/L

2.1 Annual Publication Volume and Trend

From the search results, the application of artificial intelligence in English teaching has become a research hot spot. For example, there are 13,289 articles related to "AI teaching research" in China Knowledge Network (CNKI), of which 10.7% (about 1,241 articles) are related to English teaching. The data presentation illustrates that although there is a lot of attention paid to 'AI+Education' in academia, there is a slight lack of research on 'AI+Subject Teaching' and'AI+English Subjects' (Nong, 2022). This shows that despite the relatively late start of related research, the number of articles published has shown a growing trend in recent years, and the number of articles published in this field has been steadily increasing from 2016 to 2020, reaching 19 articles in 2021 and a peak of 43 articles in 2024. This shows that the development of artificial intelligence has gradually attracted the attention of scholars, indicating that the academic community pays great attention to this field.

2.2 Current Status of Domestic Research

In recent years, domestic research on the impact of artificial intelligence on education has continued to heat up. In China, as a leading information technology, artificial intelligence has become more and more active in theoretical research and teaching practice in the field of education, which has laid a rich theoretical and practical foundation for digital education and information of education management in China.

In 2006, Jia Jiyou developed the first simulated English communication situation in China, "Xisaike"system, which integrates natural language understanding and other technologies into computer-assisted language teaching and realizes personalized language practice through human-computer dialogue (Jia, 2006). In 2013, Chen Ying designed the Secondary School English Teaching System (SAIES), which improves students' listening and speaking skills through voice interaction, scenario simulation and other modules, providing a practical paradigm for the application of AI in the basic education stage (Chen, 2013). In 2016, Feng Baocun put forward the "Artificial Intelligence English Teaching System (SAIETS)", which measures students' knowledge system with the help of data mining technology, and pushes the transformation of

the integration of technology and curriculum into teaching practice (Jia, 2006). However, compared with the relevant fields abroad, the domestic expansion of artificial intelligence into the field of education and teaching is relatively late, and there is still a gap with foreign research, the scope of research is not broad enough, the degree is not deep enough.

In recent years, the application of artificial intelligence in English teaching has become a research hot spot in the field of education, presenting a multi-dimensional development trend and practical exploration. In terms of teaching mode innovation, AI empowers foreign language education, providing a powerful driving force to achieve accurate teaching, personalized learning, intelligent scenarios and teaching mode innovation. Li Gongke focuses on the practice of project-based teaching in university foreign language classrooms, exploring the path of "AI + foreign language + multidisciplinary integration" to cultivate composite talents (Li, 2024); Zhang Suxia discusses the theoretical and practical paths of AI-enabled teaching (Zhang, 2024), emphasizing the importance of the construction of an intelligent teaching system, the enhancement of teachers' quality, the improvement of students' independent learning ability, the innovation of teaching models and the protection of data security. The importance of innovation and data security protection. From the perspective of specific teaching links, the application of artificial intelligence in English listening and writing teaching has achieved remarkable results. Xing Qiaolian(2024) found that under the background of new quality productivity and reform of higher vocational education, the application of AI speech technology to higher vocational English listening teaching can significantly improve students' listening comprehension ability and teaching efficiency, and through personalized speech recognition and feedback system, it helps students to adapt to the high speed listening materials, and improves the ability of information grasping and complex sentence comprehension. Liu Ru and Ge Ying(2024) focus on English writing teaching, pointing out that AI technology provides opportunities for solving the problems of insufficient teachers, lack of resources, and obsolete methods in the teaching of higher vocational English writing through grammar checking, writing aids, and intelligent assessment systems, and also brings new challenges. In addition, the advancement of AI technology

represented by ChatGPT has triggered an in-depth discussion in the education sector on how educational technology affects language teaching. By synthesizing the literature and empirical research and using questionnaires and content analysis, Shen summarizes the promotion and challenges brought by AI technological advances to language teaching and verifies the profound changes it has triggered in the field of education. On the whole, although the application of AI in English language teaching has achieved certain results, there are still problems to be solved in terms of technological dependence, data security, teacher and student adaptability, etc., and a more effective path of integration needs to be further explored.

2.3 Current Status of Foreign Research

Scholars abroad have started to build a base of collective insights into AI in education and ELT/L. Scholars conducted systematic reviews to examine AI across all educational disciplines.

Chen et al. focused on the annual trends, leading journals, institutions, countries, regions, theories and technologies adopted in AI and education. Systematic reviews were conducted on K-12 (Crompton et al., 2022) and higher education). Both the K-12 and higher education reviews examined topics, such as educational disciplines, levels of learning, research purposes, methodologies, annual trends, intended users, affordance and challenges. While these AI reviews across all subject disciplines, they do not only target ELT/L. It is interesting to note that the findings of the two higher education studies both found language learning one of the most common disciplines for AI use and the K-12 study found writing and language learning the only disciplines showing a growing trend in the use of AI.

Using a narrower lens to focus on ELT/L, scholars pinpointed systematic reviews on pedagogical approaches, language skills and AI tools. The reviews of Chen (2016) and Loncar et al. (2023) studied how technology was used in ELT/L, which included AI, among other technologies and programs. Zhang and Zou (2023) focused their study on the development of writing skills using AI in ELT/L. With activity theory as a framework, papers were examined on the various factors involved in using AI in ELT/L that influence the efficacy of the activity. Switching to a focus on AI tools, Baranwal (2022) examined the use of AI teachable agents in English learning and Crompton and Burke (2022) on ChatGPT.

Broadening the scope, Yang and Kyun (2022) conducted a systematic review of the use of AI in language learning. This study also included pupils whose first language was English and who were learning language skills. This could be problematic in generalizing trends across both those who speak English as a first language and those who do not, as gaining a new language can involve different teaching and learning challenges. Furthermore, Sharadgah and Sa'di (2022) focused their systematic review on K-12and higher education, but they focused their review specifically on the learning of English.

However, there are extant reviews that focus on AI and ELT/L only looked at one type of AI, such as Baranwal (2022), who examined teachable agents. This missed a review on all types of AI being used. There were studies examining AI used in teaching all languages (Yang & Kyun, 2022) missing a focus on ELT/L. Adult learners, such as training programs were also missing from these systematic reviews. Therefore, the researchers were looking for specific things, such as ELT/L skills (eg, reading, writing or types of pedagogy). What is missing is a study that examines the trends from the studies, reporting all the actual ways in which AI is being used in ELT/L. This deductive process can ameliorate confirmation bias, provide an understanding of what is emerging from the literature and offer new discoveries beyond predetermined frameworks and thinking.

III. GAPS AND FUTURE RESEARCH

This review reveals a number of gap areas that need to be further explored. The majority of existing AI research in ELT/L is from Asia (72.09%), a phenomenon that deserves the attention of researchers and industry leaders in other regions (especially the US and UK, where the global ELT industry is dominant), and there is a need to expand geographic diversity to increase the generalizability of the research in the future, especially in filling the research gaps in K-12 and adult learning scenarios.

The challenges of AI in ELT/L are under reported in current studies or affected by positive publication bias, and researchers focus more on positive outcomes than on revealing problems, and systematic exploration of the limitations of the technology needs to be strengthened. Regarding the application of emerging big language models such as Deepseek in ELT/L, the existing research is still in the beginning stage.

Research focuses on output skills such as speaking and writing, but not enough attention has been paid to the sub-skills of each language skill. The writing domain only focuses on the "feedback" part, and the potential of AI in assisting the knowledge of the writing process (e.g., conceptualization, outlining) has not been fully explored.

IV. CONCLUSION

This systematic review has comprehensively synthesized the current landscape of Artificial Intelligence (AI) applications in English language teaching and learning (ELT/L), addressing its affordance, challenges, and research gaps. The findings reveal that AI has emerged as a transformative tool in ELT/L, offering multi-dimensional support across language skills.

This review reveals multiple gaps in existing research:

(1) Geographic bias: 72% of the studies originated in Asia, resulting in a lack of generalizability to ELT contexts in Western English-speaking countries.

(2) Educational Stage and Skills Imbalance: over-focus on higher education (65%) and output skills such as speaking/writing, neglecting K-12, adult learners and receptive skills such as listening, reading and their sub-skills (e.g., phonological awareness).

(3) Methodological limitations: overuse of deductive frameworks hinders digging into emerging trends such as generative AI ethics, and the long-term effects of technology dependence. Regarding future research directions, researchers need to broaden the scope of their research by strengthening cross-cultural comparisons to cover K-12, adult learners, and non-English contexts;

deepening the integration of technology and instruction, for example, exploring the use of AI in reading strategy design; and researchers' preference for revealing problems rather than positive outcomes. Filling these gaps will enable more inclusive, effective, and responsible use of AI in ELT/L, providing collaborative direction for educators, policymakers, and researchers.

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