

Study on AI-Empowered Language Learners: Current Status and Countermeasures

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ABSTRACT

Through examining AI's role in language learning, this paper explores its advantages like personalized learning and the need for language literacy, and identifies challenges including ideological impacts and privacy concerns, concluding with suggestions for AI usage guidelines and risk mitigation to enhance language learning effectively.

Keywords: *AI empowerment, Language learners, Language literacy, Countermeasures research.*

1. INTRODUCTION

In today's era of deepening digitalization, networking, and intelligence, the "digital+" age has become the norm for our life, learning, and work. Recently, the "Beijing Artificial Intelligence Application Guide in the Field of Education" was officially released, clarifying the application standards of artificial intelligence in the field of education and guiding schools and teachers to carry out practical applications steadily and orderly. This guide is also the first artificial intelligence application guide in the field of education commissioned and released by the Beijing Municipal Education Administration.

Against this backdrop, language intelligence literacy has become increasingly important. Therefore, exploring the paths to improve college students' language intelligence literacy in the digital age has significant theoretical and practical significance.

2. LANGUAGE INTELLIGENCE LITERACY

2.1 Language Literacy

Language learning involves the comprehensive ability of language learners to understand and use language, engage in cross-cultural communication, and process information, which includes mastery of language knowledge such as phonetics, grammar, and vocabulary, as well as understanding of

language rules and structures. It also encompasses basic communication skills with others, such as listening, speaking, reading, and writing; linguistic communication abilities in different social and cultural contexts; and pragmatic abilities to understand and use language in context, intention, and function. Additionally, language learners should possess critical thinking to analyze and evaluate language materials, cultural awareness of language use differences across various cultural backgrounds, and technical application abilities with various language technology tools (such as translation software, voice recognition tools, etc.) due to the development of digital technology. Since language is a constantly evolving process, language learners should also establish a lifelong learning mindset to continuously improve their language abilities. Language literacy is not only the key to academic and professional success but also the foundation for individuals to participate in social life, achieve personal development, and engage in social interaction.

With the continuous improvement and popularization of digital technology, language learners have gradually shifted from traditional learning modes of books and tapes to AI-assisted language learning modes dominated by generative artificial intelligence. The ability to effectively use intelligent technologies and tools to enhance the efficiency and quality of language communication, learning, and work has become an increasingly important aspect of language learners' language literacy. For example, proficiency in using various

intelligent tools and platforms, such as online translation services, voice recognition software, and natural language processing tools to assist in language learning and use; utilizing search engines, databases, and other digital resources for information retrieval and evaluation; and effectively communicating and collaborating in digital environments, such as social media, online forums, and collaborative platforms. Adapting to the development trends of digitalization and intelligence, and effectively using technological resources to enhance personal language abilities is crucial for language learners to improve their competitiveness and adaptability in today's context of information explosion and rapid development of artificial intelligence technology.

2.2 Current Status of AI-assisted Language Learning

Currently, there are various forms of using artificial intelligence technology to assist students

in personalized learning, such as gamified learning, project-based learning, situational learning, intelligent tutoring systems, research assistance tools, etc. By developing innovative learning content and methods for different application scenarios, personalized learning paths are provided for students, meeting the learning needs of learners at different levels and ages. These methods enhance the learning experience and interactive feedback while combining online and offline, real and virtual scenarios, and human and intelligent entities through various blended learning forms, promoting students' autonomous learning abilities and the development of exploratory and innovative thinking in different learning environments. By promoting inquiry-based learning, interdisciplinary thematic learning, and project-based learning, the core literacy of students is comprehensively improved, ensuring that students possess problem-solving and innovative abilities in complex environments. The widely applied AI-assisted learning scenario designs mainly include the following "Table 1":

Table 1. Typical scenarios of AI-assisted learning diagram

Application	Description
AI Learning	Utilizes artificial intelligence for predictive learning diagnostics and precision teaching, continuously optimizing individual learning outcomes, enhancing the targeting of artificial intelligence teaching tools, assisting in personalized learning path planning, and pushing related course resources and projects to support individualized learning.
Language Learning Assistant	Employs natural language processing, machine learning, and other advanced technologies to provide personalized learning experiences and instant feedback for language learners of Chinese, English, and other languages. Offers functions like pronunciation correction and grammar checking. Helps learners practice speaking and listening skills through simulated dialogues.
Game-based Learning	Combines artificial intelligence technology with game design principles, integrating learning content into games, and stimulating students' interest and participation through challenges and reward mechanisms, making the learning process enjoyable and effectively enhancing students' willingness to learn actively and problem-solving a
Immersive Learning	Leveraging artificial intelligence technologies such as virtual reality and augmented reality to create immersive learning experiences, allowing students to apply interdisciplinary knowledge in simulated real-world environments, enhancing the fun and practicality of learning.
Intelligent Tutoring System	Uses machine learning technology to understand and predict students' specific knowledge gaps, providing immediate targeted explanations, exercises, and resources to help students overcome learning obstacles. Dynamically adjusts tutoring strategies based on students' progress to ensure that each student can master knowledge in the most effective way, truly achieving teaching students according to

AI assistance has rapidly become popular because it better meets the needs of learners and provides personalized and effective solutions to them.

- Youth Group: A national representative survey of 1,045 teenagers and their parents

showed that about 70% of adolescents aged 13 to 18 have used at least one generative AI tool, with AI-supported search and chatbots being particularly popular. Another report indicates that the proportion of children in third grade and above using

intelligent voice products has reached 46.3%.

- College Student Group: Surveys show that about 30% of college students have stated that they have used AI-assisted tools in their homework, and this proportion continues to grow.
- Global Perspective: According to a global AI tool usage report, the majority of students (86%) use artificial intelligence in their studies. Although this data is not specifically targeted at Chinese language learners, it can be used as a reference.
- Frequency: For both the youth and college student groups, the frequency of using AI-assisted learning may vary from person to person, but overall, it shows an upward trend. Some students may use AI tools to assist with their studies every day or week,

while others may only occasionally use them when needed.

3. COMPARISON OF THE CURRENT STATUS OF LANGUAGE LEARNERS' USE OF AI TECHNOLOGY DOMESTICALLY AND INTERNATIONALLY

3.1 International Development Status on AI-assisted Language Learning

Universities abroad employ a variety of methods to cultivate students' language learning abilities using Artificial Intelligence (AI). Here are some specific application examples ("Table 2"):

Table 2. International AI-assisted language learning products

AI tool type	Name	Learning method
Personalized Learning Experience	Duolingo	Through its AI-driven adaptive learning system (BirdBrain), Duolingo can continuously adjust course content based on the user's individual performance and progress, providing a personalized learning experience.
	SpeakPal	Offers an AI language tutor supporting the learning of over 30 languages, and provides personalized teaching based on the user's learning progress and needs.
Intelligent Systems (ITS)	Babbel	Intelligent tutoring systems can provide personalized and interactive guidance without the intervention of human teachers. They can serve as a supplement to traditional teaching methods or as a standalone application for self-study.
Automatic Speech Recognition Technology	Speechmatics	The application of AI technology in language learning also includes automatic speech recognition, which helps improve pronunciation accuracy and oral communication skills.
Cross-Cultural Language Systems (CILS)	BenevolentAI's LanguLearn	CILS utilizes advanced AI technology to customize the language learning process, dynamically adjusting to individual learner profiles, providing personalized content, teaching languages, and instilling a deep understanding of cultural nuances.
Immersive Learning Environment	Rosetta Stone	Uses AI to create an immersive learning environment, mimicking real-world scenarios through images, text, and video, which is crucial for sensory engagement in deep learning.
Memory Retention Enhancement	Memrise	Employs an AI-driven spaced repetition system, optimizing review times based on how well learners remember words or phrases, improving long-term memory and recall abilities.
Collaborative Learning	Busuu	Provides AI-driven conversations, simulating real interactions, and enhancing learners' confidence and language use abilities in actual conversations.
AI Chatbots	Ellie	In the EFL (English as a Foreign Language) environment, a task-oriented voice chatbot named "Ellie" is introduced as an English conversation partner, with students showing high enthusiasm and task success rates in their interactions with Ellie.
Intelligent Assistants (IPA)	Amazon Echo show	Significantly improves listening and speaking skills for L2 learners, with learners reporting that IPA provides more verbal interaction opportunities and reduces speaking anxiety.

AI tool type	Name	Learning method
Teacher-Created Personalized Learning Activities and Courses	Smart Sparrow	Offers an adaptive e-learning platform that allows teachers to create personalized learning activities and courses, including language learning.

These methods demonstrate the diverse applications of AI in language learning, from personalized learning plans to intelligent tutoring, and from cross-cultural communication to the creation of immersive learning environments. AI technology is changing the way language learning is conducted, making it more personalized, interactive, and efficient.

3.2 Development Status on AI-Assisted Language learning in China

In China, the development of AI for language learning is divided into corporate and school levels. (“Table 3”¹)

In addition to the aforementioned companies, domestic internet giants such as Alibaba, ByteDance, and JD.com are also making strategic moves in the field of AI language learning. For instance, Alibaba’s AI technology is widely applied across various business sectors including e-commerce, finance, and logistics, which also encompasses language learning-related products and services; ByteDance’s AI technology is primarily utilized in user profiling and intelligent recommendation scenarios, but its products like TikTok also involve language learning and cultural dissemination.

Many universities in China are actively exploring and applying artificial intelligence (AI) technology to enhance students' language learning abilities. For example, Tsinghua University’s Natural Language Processing and Social Humanities Computing Laboratory has developed several intelligent writing assistants and language translation systems as AI tools for language learning, helping students improve their language skills; Shanghai Jiao Tong University has developed an intelligent language teaching platform that provides personalized learning resources and exercises for students through data analysis and machine learning technology; Beijing Language and Culture University offers speech recognition and semantic analysis tools for foreign students learning Chinese, helping them improve their

proficiency in the language; Fudan University has developed an intelligent language tutoring system that provides real-time language practice and feedback through natural language processing technology; and other universities such as Zhejiang University, Harbin Institute of Technology, and Nanjing University are also helping students improve their speaking, listening, and writing skills by developing AI speech recognition and machine learning technologies.

The AI learning tools developed by these universities primarily utilize the following technologies and methods: (1) Intelligent teaching platforms: Providing personalized learning resources and online exercises; (2) Speech recognition technology: Used for oral practice and pronunciation correction; (3) Natural language processing: Used for writing assistance and language comprehension training; (4) Data analysis: Analyzing learning behaviors to provide personalized feedback; (5) Virtual reality (VR) and augmented reality (AR): Creating immersive language learning environments; (6) Intelligent tutoring systems: Providing personalized tutoring and support, etc.

1. <https://baijiahao.baidu.com/s?id=1805005450463456862&wfr=spider&for=pc>

Table 3. Main domestic AI-assisted language learning products

Company name	Product name	Product features
iFLYTEK	Intelligent Speech Translation Device/Language Learning Software	Utilizes intelligent speech technology to provide high-quality speech recognition, speech synthesis, and speech translation services, helping users improve language learning outcomes.
Baidu	Duolingo Collaboration or Self-developed Products	Combines natural language processing and computer vision technology to offer personalized learning paths, intelligent recommendations, and real-time feedback, creating an efficient and personalized language learning experience for users.
Tencent	Tencent Happy Mouse English, etc.	Integrates social and gaming elements, using AI technology to provide an entertaining language learning experience for users.
DouShen Education	DouShen AI	Based on knowledge graph technology, with digital avatars and neural network graphs + end-to-end high-quality content production capabilities, providing super human-like voice synthesis technology to help students learn language and literature efficiently.
SuperTech	Full-stack Technology and Application of Virtual Digital Humans	Focuses on the full-stack technology and full-scenario application of virtual digital humans, which can provide solutions such as virtual language teachers for language learning, creating an immersive learning environment.
Metaverse Technology	Metaverse Full-link Intelligent Solutions	Relying on core elements of data, algorithms, and computing power, providing a one-stop AI digital virtual technology solution, offering virtual scenarios and interactive experiences for language learning, creating a more immersive language learning environment.

4. ISSUES WITH AI-ASSISTED LANGUAGE LEARNING

AI-assisted language learning has effectively addressed the dilemmas of traditional language learning, to some extent promoting educational equity and allowing more learners to share high-quality online resources, sweeping through the traditional language education field with an unstoppable momentum. While thriving, some potential problems and risks should not be overlooked.

4.1 Ideological Issues

The vast amount of language data used to train AI learning tools often comes from Western social and cultural life, inevitably reflecting the thoughts and values of people under Western ideological influences. Learners may be exposed to such language data during their studies, which could, over time, affect their worldview and values.

4.2 Privacy Issues

AI-assisted language learning requires users to register personal information, and both search data

and completed exercises contain a large amount of personal privacy information. Once used by users, these data leave traces on the internet; additionally, to develop large language models, machine translation platforms and corpus processing platforms are needed, which typically collect and store user information. This leaves room for the leakage of user privacy information.

4.3 Cognitive Outsourcing and Thinking Dulling Issues

The risks of cognitive outsourcing and thinking dulling that arise in the use of artificial intelligence refer to the potential loss of independent thinking and autonomous judgment abilities when individuals or groups overly rely on generative AI for cognitive activities or decision-making. This can lead to the outsourcing of cognitive processes to artificial intelligence, and simultaneously, thinking may become dull or lack flexibility. Specifically, the risk of cognitive outsourcing means that individuals or groups no longer actively use their own knowledge and experience to think and analyze when facing problems but directly depend on the answers or suggestions provided by artificial intelligence. This dependence may lead to a gradual degradation of cognitive abilities,

rendering individuals or groups unable to solve complex problems independently; the risk of thinking dulling refers to the possibility that individuals or groups, accustomed to the rapid response and efficient processing of artificial intelligence, may gradually neglect their own thinking processes, leading to dull or less innovative thinking. This dulling may manifest as the solidification of thinking patterns, a decline in creativity, and a weakening of problem-solving abilities.

In the field of education, the risks of cognitive outsourcing and thinking dulling are particularly alarming. Education is not just about imparting knowledge; more importantly, it is about fostering students' independent thinking, innovation, and problem-solving abilities. Over-reliance on artificial intelligence may prevent students from fully developing these key abilities, thereby affecting their future development and growth.

5. MEASURES AND COUNTERMEASURES

5.1 Establishing AI Usage Guidelines

At the societal and school levels, it is important to strengthen publicity and raise learners' awareness of the risks of over-reliance on generative AI, such as cognitive outsourcing and thinking dulling. Encourage learners to maintain independent thinking and critical thinking when using artificial intelligence and not to blindly accept AI's output results. At the same time, relevant departments should establish clear guidelines and guidelines for the use of artificial intelligence, control the frequency and manner of use reasonably, and strengthen the cultivation of students' independent thinking and innovation abilities to ensure that they can maintain and develop their cognitive abilities while using artificial intelligence; clarify which tasks are suitable for using artificial intelligence and which tasks require independent completion by the user, and AI-assisted completion should be clearly marked. By guiding users to use artificial intelligence reasonably through such norms, avoid the risks of over-reliance and moral plagiarism.

5.2 Strengthening AI Usage Training

It is necessary to train AI-assisted learners and educators on the use of artificial intelligence to understand its working principles, advantages, and

limitations. Enhance teachers' and students' information literacy and digital capabilities through training, enabling them to better utilize artificial intelligence for learning and teaching. It is also necessary to encourage learners to combine various learning resources and methods, including traditional teaching materials, online courses, practical activities, and other diverse learning methods, to promote the diversity and flexibility of learners' and educators' thinking, avoiding dull thinking and over-reliance on AI.

5.3 Establishing AI Assessment Mechanisms

There is a must to further standardize AI-assisted learning by establishing assessment mechanisms for the effectiveness of artificial intelligence use, regularly evaluating language learners' performance and gains in the process of using artificial intelligence. Educators can identify potential risks and issues through assessments and adjust usage strategies and methods in a timely manner.

5.4 Developing Effective AI Risk Defense Technologies

In response to the issues of ideological penetration and personal privacy leaks in the sharing of online digital resources, research institutions and related enterprises should increase the development of AI-assisted learning tool risk prevention technologies, enhance the identification and blocking of potential dangers in the use of big data, and ultimately serve humanity with technology.

In addition, educational research institutions, social organizations, and enterprises should actively carry out basic, mechanistic, and applied research on the application of artificial intelligence in education and teaching. By building a collaborative platform for government, industry, academia, research, and application, and establishing a long-term coordination mechanism, they can continuously promote the deep integration and innovative application of artificial intelligence and education.

6. CONCLUSION

In the digital age, traditional language learning is gradually evolving towards intelligent language learning, and the integration and innovation of

artificial intelligence and education have become an inevitable trend in future educational reform. The rational use of artificial intelligence and other digital tools has become an important way to improve language learners' language literacy and a survival skill that must be mastered to adapt to future society. With "cultivating morality and nurturing talent" as the educational goal, society, enterprises, and schools should be fully prepared in all aspects, by formulating relevant policies, developing risk defense technologies, constructing more scientific digital teaching platforms, innovating teaching methods, and enhancing educators' digital technology application capabilities. They should meet the opportunities and challenges of the artificial intelligence era in the education industry and cultivate foreign language talents that better meet the needs of the times.

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