Research on Innovative Teaching Strategies for Minority Language Teaching in the Context of Artificial Intelligence

Zijie Kang

School of Languages and Communication Studies, Beijing Jiaotong University, Beijing, China

Abstract: This article analyzes the characteristics and developmental challenges of teaching less commonly taught languages. It examines the role of AI in this field, emphasizing the critical importance of AI technology in improving teaching resources, promoting observational teaching, and enhancing teaching interactions. The prospects for using artificial intelligence in teaching less commonly taught languages are vast, and finding a balance between technological progress in AI and educational philosophy is essential. This paper delves into specific innovative teaching strategies: firstly, by observing teaching feedback to devise personalized teaching plans; secondly, by leveraging AI technology to enrich teaching resources and thereby improve teaching outcomes; and finally, by fully utilizing AI's efficient interactive capabilities to provide robust support for cross-cultural teaching and practical application of less commonly taught languages.

1 INTRODUCTION

1.1 Background

With the rapid development of economic globalization, the economic connections between countries around the world are becoming increasingly close, and the demand for high-quality foreign language talents in society is growing. In recent years, the rapid development of artificial intelligence (AI) has had a certain impact on various industries. According to statistics from McKinsey & Company, the number of organizations using AI has more than doubled since 2017, and as of 2022, 50% to 60% of organizations are utilizing AI (McKinsey & Company, 2022). A study surveying over 1,000 students revealed that more than 89% of students use GPT to assist with their homework. Many public schools in the United States have prohibited the use of GPT due to concerns about cheating. Jenna Lyle, a spokesperson for the New York City Department of Education, believes that AI tools cannot cultivate students' critical thinking and problem-solving abilities (Lyle, 2023). The use of AI in teaching faces significant challenges. However, against the backdrop of the digital transformation of education, the integration of AI with minority language teaching has brought opportunities. Leveraging AI technology to empower minority language teaching is crucial for innovative teaching reforms in these languages.

1.2 Foundation and Significance

Stephen Krashen proposed the Input Hypothesis in the early 1980s, which suggests that language acquisition occurs when learners are exposed to comprehensible input slightly above their current level (Krashen, 1985). AI can provide tailored input at the appropriate level and pace for individual learners. Merrill Swain proposed the Output Hypothesis, which emphasizes the importance of producing language for learning (Swain, 1985). AI can provide opportunities for language production through interactive exercises, writing prompts, and speech recognition technology. Zone of Proximal Development (ZPD) emphasizes the importance of social interaction and collaborative learning in promoting cognitive development (Vygotsky, 1986). AI can support the ZPD by providing scaffolding and collaborative tools that help learners achieve their potential. In summary, these three seating theories highlight the potential of AI to advance the teaching of minority languages from the perspectives of input, output, and interactive collaboration.

Leveraging AI-powered speech recognition and speech synthesis technologies, along with AI-driven automated assessment, can facilitate intelligent

tutoring for students (Guo, 2024). For instance, language learning applications such as Duolingo, Hellotalk, and Babbel provide students with immediate feedback during oral practice, which aids in enhancing accuracy and fluency of pronunciation. This reduces the cost of teaching practice for teachers and subsequently improves the efficiency of teaching. AI technologies encompass a broad spectrum, including language recognition, natural language processing, image recognition, machine learning, and expert systems, among others (Cao, 2024). For instance, in the teaching of less commonly taught languages, AI technology can be utilized to conduct one-on-one dialogue practices, alleviating the issue of teachers struggling to ensure effective classroom dialogues in a one-to-many setting. Rudolph et al. have explored the potential applications of ChatGPT in higher education, including introducing innovative assessments for teaching including the introduction of innovative teaching assessments, innovative teaching strategies, the provision of experimental and experiential learning, and the facilitation of collaborative learning and teamwork (Rudolph et al., 2023). In summary, AI is widely applied and holds immense potential in the teaching of less commonly taught languages, complementing and enhancing the field by providing high-quality resources and efficient academic research tools.

In summary, with the deepening of globalization and the rapid development of AI technology, the field of minority language teaching is undergoing a profound transformation. Traditional teaching models for minority languages are gradually becoming digitalized, intelligent, and personalized, with AI ushering in a new normal for conventional teaching methods. However, there is currently a scarcity of specific innovative teaching strategy research for minority languages, which makes it difficult to provide practical guidance for teaching model innovation. This paper explores feasible innovative teaching strategies for minority languages in the context of AI, which holds certain innovative and practical significance for reference.

2 CHARACTERISTICS AND DEVELOPMENT DILEMMAS OF MINORITY LANGUAGE TEACHING

2.1 The Guiding Nature of Relevant Cultural Education

In the teaching of minority languages, due to cultural differences with the countries associated with these languages, it often necessitates the involvement of related cultural education to guide students in gaining a deeper understanding and mastery of such linguistic knowledge. Different cultural values and cultural diversity are paramount issues in teaching (Thijs et al., 2024). In the teaching of minority languages, cultural education should be integrated into educational activities, encompassing the history, customs, arts, ethics, beliefs, and other societal habits that naturally form and are evolving in the countries associated with these languages. Cultural education and language teaching are complementary to each other, essentially, culture is constituted by the belief systems of language users about the world, life, and society (Jie, 2023). As a supplement to minority language teaching, cultural education serves two purposes: on one hand, it prevents the monotonous focus on grammar explanations to some extent, thereby stimulating students' interest in language learning. On the other hand, it guides students to understand the origins, development, and usage contexts of the languages, leading to a more profound grasp of linguistic knowledge.

However, the practical implementation of cultural education in minority language teaching is far from ideal and faces numerous shortcomings. Firstly, minority language teaching involves cross-cultural communication, and teachers, due to the lack of cultural context, inevitably have gaps in their knowledge. Secondly, given the limitations of practical conditions, it is difficult to immerse oneself in the relevant cultural environment for extended periods, making it challenging to perceive the cultural background firsthand. At the same time, foreign language textbooks are one of the cores of foreign language classrooms and play a significant role in fostering cross-cultural awareness and communicative competence in the teaching of less commonly taught languages (Zhao & Liu, 2024). In the actual teaching process, there is still a phenomenon of lacking comprehensive paper-based teaching materials, such as in the teaching of Portuguese and Nepali, which are less commonly

taught languages. Due to the absence of authoritative and uniformly bound textbooks, printed handouts are used as the primary teaching materials.

2.2 The Interactivity in Minor Language Teaching

In the teaching of less commonly taught languages, due to the particularities of the languages, active student participation is required to enhance the interaction between teachers and students, thereby ensuring the implementation of teaching efficiency and outcomes. The fluency of minor languages is enhanced in interaction, and the speaker's response speed, fluency, and error rate can profoundly reflect the level of mastery of these languages (Alhusain, 2024). For students majoring in less commonly taught languages, they almost always start from scratch in learning a new language. Concurrently, compared to traditional subjects that tend to favor one-way teaching in the classroom, the teaching of less commonly taught languages is highly interactive, requiring students' expressions and thinking to be achieved through communication. Enhancing the interactivity in the teaching of less commonly taught languages not only helps to cultivate students' basic pronunciation and improve their near-native language sense but also benefits teachers in better grasping the teaching situation, timely adjusting teaching methods, and improving teaching quality and efficiency.

However, it is worth noting that the interactivity between teachers and students in the actual teaching of less commonly taught languages is lacking and in urgent need of resolution. Firstly, the first two years have a higher number of language foundation courses, which are rather dry and intense in teaching and learning, easily overlooking the importance of communication and interaction. Secondly, Teachers may not fully and accurately grasp the characteristics of students in the new era, leading to less than satisfactory interactive effects in teaching. Coupled with the fact that students grow up in the era of fragmented internet information, they may lack focus in the classroom, leading to minimal effects of interaction implementation. Additionally, students have different language foundations, making it difficult to achieve comprehensive and efficient one-on-one interaction in the classroom. Although foreign teachers corresponding to the language are often provided in the teaching of less commonly taught languages and engage in classroom interaction, in reality, when there are only foreign teachers and students in the classroom, the language communication between foreign teachers and students also becomes a barrier in teaching, and the accuracy of teaching less commonly taught languages can also be compromised.

2.3 Minor Language Teaching Aiming at The Practical Application

In the teaching of less commonly taught languages, there is a practical purposefulness. In summary, the cultural guidance and interactive communication in the teaching of the former two aspects also serve the actual application. The ability to apply language includes not only the ability to listen, speak, read, and write, but also the ability to use language in different contexts, such as the practical use of slang, tone, and professional knowledge in the context of economic and trade. Enhancing the orientation of practical application in the teaching of less commonly taught languages can not only optimize recent teaching but also pave the way for long-term teaching development, such as cultivating students' professional qualities, spreading culture, and introducing excellent foreign cultures.

In practice, despite the awareness of the importance of practical application in the teaching of less commonly taught languages, the outcomes remain minimal. To truly integrate the practical application into teaching, educators need to create scenarios for the actual use of these languages to achieve the objectives of experiential learning. Traditional classroom teaching sessions are short and aimed at knowledge dissemination, lacking real-life scenarios for the authentic use of less commonly taught languages, making it difficult to achieve practical application exercises within the classroom setting.

3 IMPACTS AND ESSENTIALS OF ARTIFICIAL INTELLIGENCE ON MINOR LANGUAGE INSTRUCTION

3.1 Database Perfection

Artificial intelligence is built upon vast databases and continuously self-optimizes and improves during use, thereby forming a relatively comprehensive knowledge system of national cultures. AI facilitates the teaching of less commonly taught languages by providing online resources, collaborative platforms, and personalized teaching networks.

Firstly, regarding academic research in the teaching of less commonly taught languages, artificial intelligence assists in completing a large amount of literature retrieval and organization and utilizes related data analysis platforms to analyze complex data. For instance, IBM Watson Studio and Microsoft Power BI with AI are used to summarize data patterns and trends, as well as to create visualizations, thereby enhancing the efficiency and accuracy of teaching academic research.

Secondly, in terms of optimizing teaching strategies for less commonly taught languages, artificial intelligence analyzes and refines teaching plans based on a vast array of real-case scenarios. For instance, AI-driven Theoretical Framework Development can extract keywords and themes from a plethora of texts, offering new research and teaching perspectives for less commonly taught languages. AI can accurately analyze and grasp students' learning needs and weak points through data analysis, thereby customizing personalized learning paths and content for students in the teaching process (Guo, 2024). For instance, AI can adjust the content and difficulty level of teaching materials in vocabulary, grammar, listening, speaking, reading, and writing based on students' learning behaviors and performance, thereby enhancing teaching effectiveness.

Additionally, concerning the use of materials for less commonly taught languages, AI systems contain a wealth of data resources such as literary works, cultural history, and course materials related to these languages. These can serve as a powerful supplement and expansion to textbooks, increasing the breadth and depth of teaching in less commonly taught languages and compensating for the limitations of textbook length and gaps in teachers' knowledge.

3.2 Facilitating Observational Teaching

Artificial intelligence-generated content (AIGC) refers to the technology that generates text, images, sounds, videos, code, and other content based on algorithms, models, and rules. Observational teaching, which involves the use of audio and visual display resources in the classroom, is significantly enhanced by technologies such as AIGC language recognition, video examples, and virtual visual processing. These AI-driven tools play a crucial role in facilitating observational teaching and are of great importance to the teaching of less commonly taught languages.

Firstly, regarding pre-class teaching, the use of artificial intelligence facilitates students' pre-class preparation by guiding them to correctly utilize AIGC for independent learning. Taking the teaching of Spanish in China as an example, software such as Daily Spanish Listening, Spanish Assistant, and Diccionario leverage AI technologies like speech recognition, machine translation, and grammar correction for pre-class instruction.

Secondly, for in-class teaching, AIGC technology can simulate real conversation scenarios and provide interactive resources for instruction. For instance, the use of audio and visual displays in classroom teaching has become relatively widespread, and multimedia use has become the norm. However, to truly reflect interactive scenarios, appropriate one-on-one human-computer dialogues also play a role. Khan Academy's Khanmigo is an AI that can provide one-on-one tutoring for students through simulated classroom discussions and case analyses in various forms. This interactive teaching not only compensates for the teacher's inability to achieve one-on-one detailed instruction but also allows students to grasp knowledge in a more vivid context, thereby improving teaching efficiency.

Lastly, for post-class teaching, AIGC can be simply described as promoting students' post-class organization and consolidation. For example, Kimi AI Assistant's machine translation, writing correction optimization, and question answering can be utilized for post-class instruction. Additionally, online live streaming and replays on course platforms extend the value cycle of less commonly taught languages' teaching, helping to resolve student questions promptly, breaking the temporal and spatial limitations of teaching activities, and facilitating post-class instruction.

3.3 Promoting Interactive Teaching

Interactive simulation technology based on artificial intelligence provides language use models for teaching, reducing the distance and cost between interpersonal communications to a certain extent, and solving the practical application problems of less commonly taught languages in terms of time and space. Considering the particularity of teaching less commonly taught languages, which is always oriented towards realistic expression and practical application, the promotion of interactive teaching by artificial intelligence is crucial for these languages.

AI technology simulates real language environments, offering immersion and efficiency in learning less commonly taught languages. In particular, virtual reality (VR) technology has been applied in the teaching of less commonly taught

languages, providing students with an immersive learning environment. Taking the Double 4 VR intelligent interactive teaching system as an example, the system simulates real language environments through three-dimensional images and real-time interactive functions, allowing students to interact with virtual characters in virtual scenarios such as shopping malls, restaurants, and streets, practicing language use. This teaching method, which simulates real environments, not only stimulates students' interest in learning and increases their participation but also promotes the improvement of oral expression skills through real-time interactive functions. Additionally, the system provides real-time voice correction and grammatical guidance, offering corresponding scores and suggestions based on students' learning performance, thereby enhancing teaching efficiency.

4 INNOVATIVE TEACHING APPROACHES FOR MINOR LANGUAGES

4.1 Utilizing AI for Formulating Individualized Teaching Schemes

AI enhances teaching efficiency through intelligent interaction and feedback. With the aid of speech recognition and natural language processing technologies, AI systems can monitor and analyze students' oral practice in real time, providing immediate pronunciation corrections and fluency feedback (Guo, 2024).

Specific innovative strategies are as follows: Teachers collaborate in the development or refinement of classroom recording systems and increase AI intervention in the classroom. AI can be used to record students' pronunciation, word usage, grammar collocation, fluency, and other aspects of their speech on a one-to-one basis. Then, through AI's data analysis and processing, suggestions are provided for students in terms of pronunciation and grammar. Teachers, combining their teaching experience, offer more refined, professional, and practical methodological advice, and implement supervision to thereby enhance the effectiveness of classroom feedback. This fully leverages AI to facilitate observational teaching of less commonly taught languages, record classroom feedback in real time, and propose personalized teaching plans. As an

auxiliary tool, AI undoubtedly contributes to the form, efficiency, and effectiveness of teaching less commonly taught languages.

4.2 Utilizing AI for Teaching Resource Enrichment

Considering factors such as student interests, learning styles, and teaching progress, the AI system is capable of recommending appropriate learning materials, exercises, and auxiliary tools to enrich teaching methods (Guo, 2024). Teaching resources should not be limited to textbooks; all forms of music, images, videos, and more are part of the teaching resources. It is evident that the vast database of AI greatly enriches the presentation of teaching resources.

The specific innovative strategies are as follows: Teachers can utilize AI to search for relevant knowledge systems during the preparation of courseware and classroom design before class, serving as a supplement to textbooks. Additionally, for post-class consolidation exercises, AI can be used to collect materials in listening, speaking, reading, and writing for various less commonly taught languages, finding the most suitable exercises. It is worth noting that, based on the interactive and practical application characteristics of less commonly taught languages, consolidation exercises should not be limited to written forms. AI can provide a vast database of audio materials for less commonly taught languages. Utilizing AI search and even creating images that align with classroom knowledge can guide students in exercises such as descriptive speaking and dialogue based on images. This fully leverages AI's massive data and information retrieval capabilities, enriching teaching resources and addressing potential limitations in available resources. AI undoubtedly expands the forms of teaching less commonly taught languages, and the rich teaching resources promote the teaching of these languages.

4.3 Utilizing AI for Promoting the Practical Application in Teaching

AI can simulate real-life language communication scenarios, assisting students in practicing listening and conversational skills and promoting their practical language use (Guo, 2024). Culture plays a significant role in the teaching of less commonly taught languages, and the purpose of such teaching is to facilitate practical application. AI technology extends the opportunities for cross-cultural

communication and practice, enhancing language practical application skills and cultural understanding abilities, thereby aiding in the teaching of less commonly taught languages.

The specific innovative strategies are as follows: Teachers can utilize AI virtual technology to provide realistic and situational teaching scenarios for less commonly taught languages, which is conducive to students deepening their impressions and enhancing learning efficiency through hands-on practice, thereby achieving effective teaching. For instance, the official website of Sagrada Família in Spain employs AI virtual technology to create images that vividly and meticulously depict the splendor of the basilica. The use of such AI technology in teaching by educators can give students a feeling of being present on-site, strengthening teaching effectiveness. Moreover, most less commonly taught language majors offer opportunities for exchange studies, one of the main purposes of which is to cultivate language sensitivity and related cultural literacy in a genuine linguistic environment, thereby promoting the practical use of less commonly taught languages. AI technology can set up the required scenarios anytime and anywhere, breaking the constraints of time and space in reality. This requires powerful AI technology as a condition, and AI's efficient interactive functions undoubtedly compensate for the deficiencies in cross-cultural communication and practical application teaching of less commonly taught languages, thereby promoting the teaching of these languages.

5 CONCLUSION

AI has vast prospects in the teaching of less commonly taught languages, with teachers leading and AI serving as an indispensable and increasingly integrated tool. Seeking a balance between technological progress in AI and educational philosophy ensures that AI technology and the role of teachers effectively complement each other, jointly driving the transformation and innovation in the teaching of less commonly taught languages.

This paper discusses innovative teaching strategies for less commonly taught languages in the context of artificial intelligence: utilizing AI's extensive database, information processing capabilities, and efficient interactive functions, which play a significant role in cross-cultural communication, supplementary teaching resources, and practical application exercises within the teaching of less commonly taught languages. It also proposes effective and concrete implementation

strategies, enriching the relatively unexplored field of AI technology application in teaching less commonly taught languages. This approach holds a certain level of innovation and practical reference significance.

With ongoing exploration and practice, AI is anticipated to assume a more critical role in the teaching of less commonly taught languages in the future. AI technology, in collaboration with teachers, can conduct more efficient digital teaching of less commonly taught languages, leading to a qualitative shift in the form, efficiency, and effectiveness of such teaching practices.

REFERENCES

Alhusain, L. 2024. How is L2 pair interaction related to fluency and language use? A quantitative approach. *Applied Corpus Linguistics* 4(3): 100102.

Cao, J. 2024. Research on the application of artificial intelligence in primary school English reading teaching. *Journal of Jilin Province Institute of Education* 09: 56-60.

Guo, W. 2024. Discussion on the challenges and future development of artificial intelligence in foreign language teaching. In Proceedings of the 5th Symposium on Educational Innovation and Experience Exchange 2024. *Dalian Jiaotong University* 11-13.

Jie, Z. 2023. Philosophical inquiry into intercultural communication and the teaching of culture in foreign language teaching. *Journal of Language and Cultural Education* (1): 59-70.

Krashen, S. 1985. The Input Hypothesis: Issues and Implications. London, UK: Longman Publishing Press.

Lyle, J. 2023. New York City schools ban ChatGPT, citing the negative effect on education. The Washington Post. Retrieved from https://www.washingtonpost.com/education/2023/01/05/nyc-schools-ban-chatgpt/

McKinsey & Company. 2022. The state of AI in 2022--and a half decade in review. Retrieved from https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-state-of-ai-in-2022-and-a-half-decade-in-review

Rudolph, T., Flath, C., Weinhardt, C., van der Aalst, W., & Hinz, O. 2023. Possible applications of ChatGPT in higher education. In Proceedings of TEEM 2023: The Eleventh International Conference on Technological Ecosystems for Enhancing Multiculturality.

Swain, M. 1985. Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In S. Gass & C. Madden (Eds.), Input in Second Language Acquisition. *Newbury House Publishers* 235-253.

Thijs, J., Krijnen, M., van Vemde, L., Hornstra, L., Mainhard, T., & Wansink, B. 2025. The diversity teaching beliefs scale: Addressing cultural diversity, commonalities between cultures, and the national culture in the classroom. *Teaching and Teacher Education* 153, 104846.

Vygotsky, L. S. 1986. Thought and language. Cambridge, MA: The MIT Press.

Zhao, Y. F., & Liu, S. T. 2024. The use and teaching of minor language textbooks. *Basic Foreign Language Education* 05: 101-108.