

Research on the Application of Artificial Intelligence in University Oral English Teaching

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ABSTRACT

With real-time capability, ubiquity, accuracy, and generation of diverse scenarios for oral practice, Artificial Intelligence technologies, such as voice recognition, big data, and large language models, have brought entirely new experiences and epoch-making changes in various aspects of university oral English teaching, including course design, autonomous learning, in-class and off-class communication and interaction, evaluation and feedback. This paper briefly describes the concept of Artificial Intelligence and the theoretical bases for its application in oral English teaching, and explores the advantages and approaches of its application in university oral English teaching in terms of practice, interaction and evaluation.

KEYWORDS

University oral English teaching; Application of Artificial Intelligence

1 Introduction

1.1 The concept of Artificial Intelligence

In 1956, McCarthy, Minsky, Rochester and others proposed the concept of Artificial Intelligence (AI) while they were researching on how to use machines to simulate human intelligence. In current terms, Artificial Intelligence is an emerging technology that studies and develops theories, methods, and application systems for simulating, extending and expanding human intelligence. It aims to simulate certain human cognitive processes and intelligent behaviors, such as learning, thinking, analyzing, conversing, and planning.

1.2 The background of the application of Artificial Intelligence in university oral English teaching

"Education Informatization 2.0 Action Plan" and "Innovation Action Plan for Artificial Intelligence in Higher Education Institutions," both released in 2018 by the Ministry of Education of China, pointed out that universities and colleges should build on advanced technologies such as Artificial Intelligence and rely on AI devices and terminals to vigorously promote the transformation of teaching models. The "College English Teaching Guidelines" (2020) stated that "College English teaching should vigorously promote the integration of the latest information technology with course teaching and bring to full play the role of modern educational technology, especially information technology, in foreign language teaching."

In practice, the teaching hours for university oral English courses are short, usually at most two sessions per week, often with inadequate opportunities for 40 to 50 students per class. Even in some universities with overseas teachers for oral English teaching, the opportunities for each student to engage in one-on-one interactions with native teachers are also very limited. Most students can only participate in group discussions among themselves where their pronunciation, intonation and expression errors cannot be corrected in a timely manner. In addition, a considerable number of students are afraid of making mistakes or are too shy to speak in front of their classmates, resulting in a low level of participation in oral discussions. On the other hand, only a couple of students are very eager to seize every opportunity to speak. If teachers lack guidance and balance, it is a common spectacle in oral English teaching that only a few students participate while the majority are just onlookers.

Now Artificial Intelligence can offer some new perspectives and solutions. The big data processing, large language models and machine learning of Artificial Intelligence can conduct real-time analysis of the data generated from all teaching activities, provide instant assessment and feedback on oral tasks, and push customized oral tasks, learning resources and plans according to individual student's needs and competence. Artificial Intelligence can also create simulated scenarios for human-computer interaction, thereby stimulating students' initiative by making the learning process more personalized, diversified, and collaborative. Among other things, the repetitiveness, autonomy, openness, and expansibility of AI make its application in university oral English teaching particularly appealing.

2 The theoretical bases of the application of Artificial Intelligence in university oral English teaching

The application of Artificial Intelligence in university oral English teaching can find strong support from diverse teaching theories. Constructivist theory, for one thing, states that learners acquire knowledge through the process of meaning construction, with the assistance of others and the use of necessary learning materials, within a specific context. Artificial Intelligence can create simulated learning contexts, tailor personalized learning resources for individual learners, provide suggestions for and evaluate their independent learning, and thereby helping them achieve knowledge construction.

Besides, behaviorism learning theory suggests that learning is a process of stimulating and reinforcing a response. In university oral English teaching, AI can offer abundant authentic oral input, which students can interact with by imitating and repeating to acquire correct pronunciation, intonation and expression.

Krashen's "Input Hypothesis" emphasizes that lots of comprehensible input are essential to effective language acquisition. AI can provide students with abundant oral English resources, with different accents and speech rates. This enables students to accumulate vocabulary, sentence patterns and idiomatic expressions in an authentic language environment, laying a solid foundation for their oral output.

Swain's "Output Hypothesis," on the other hand, stresses that language output can help learners acquire and reinforce knowledge and boost language automation and fluency. AI, with its powerful generative capabilities, can offer students abundant and instant opportunities for oral practice, such as talking with chatbots or taking online oral tests. It can also offer evaluation and feedback in real-time, helping them promptly identify and correct errors and improve the quality and fluency of their oral expression.

Personalized learning theory, then, states that personalized learning support should be offered to individual learners with distinctive learning styles, interests, and needs. With big data, machine learning, as well as an accurate understanding of each student's learning features and oral English competence, AI can generate tailored learning plans and teaching content and push suitable oral resources and tasks, thus catering to individual learning styles and needs and enhancing the effectiveness of oral English teaching.

Finally, situational cognition theory suggests that knowledge acquisition occurs within social contexts and through practice when learners construct the meaning of knowledge via interaction with their environment and others. AI can create virtual scenarios for oral practice, and online learning communities for more opportunities of interaction and collaboration. These approaches can enhance the learning experience, improve situational awareness, and boost oral competence.

3 The advantages of the application of Artificial Intelligence in university oral English teaching

Speech recognition technology enables Artificial Intelligence to receive voice signals while semantic recognition technology allows Artificial Intelligence to understand the meaning of these signals. Dialogue management technology makes it possible for Artificial Intelligence to think and organize language output. Natural language generation technology helps Artificial Intelligence to produce meaningful language output. In this context, Artificial Intelligence not only increases the input of oral learning resources and ensures the accuracy of oral output, while taking into account cultural differences in language expression, but also increases students' opportunities of oral practice in terms of language output.

The vast databases and corpora of Artificial Intelligence, combined with its oral language proficiency acquired through machine learning, and further enhanced by Virtual Reality (VR) and Augmented Reality (AR) technologies, can provide students with oral demonstrations and guided reading, while creating simulated oral communication scenarios. Artificial Intelligence can also record, evaluate, and correct students' oral output in terms of their preparation time, pronunciation, intonation, grammatical accuracy, vocabulary usage, fluency, coherence and relevance of content. Moreover, AI can provide real-time feedback and suggestions for students' mistakes and weaknesses, and recommend tailored oral practice plans and materials. This process allows students to engage in human-computer interaction in real-time, continuously improving the accuracy and fluency of their oral expression.

Empirical research by Green and O'Sullivan found that, with the aid of AI, 70% of learners showed significant improvement in their oral English competence after two months of oral practice. In AI-assisted oral learning, students can also master a wider range of more complex vocabulary and sentence patterns, and so enhance the fluency of their oral expression. (Wu Jianhao, Zhou Wanting, and Cao Chao, 2024)

Meanwhile, Artificial Intelligence can assist teachers in designing oral English teaching tasks and activities, saving them a significant amount of time and effort that would otherwise be devoted to course design and grading of oral assignments. This enables teachers to have more time for one-on-one guidance and to explore more deeply and broadly about the design of teaching tasks and activities, thereby enriching the content and enhancing the depth of oral English

teaching.

4 The application of Artificial Intelligence in university oral English teaching

Artificial Intelligence can screen, update, and push oral English learning resources in real-time tailored to individual student's needs and competence, thereby introducing fresh changes to the current monotonous content of oral English teaching models. This means that teachers can use AI to select oral English learning resources from as multiple perspectives as possible to expand students' knowledge base and provide them with a rich knowledge reserve for oral communication.

4.1 Simulate authentic oral communication scenarios

The voice recognition technology of Artificial Intelligence can imitate various voices, accents, and speech rates, thus enabling it to simulate multiple roles in virtual scenarios. When designated a teacher's role, it can adjust the speech rate or vocabulary in real-time to the students' comprehension. When assigned a student's role, it can pick up students' language input and provide reminders, suggestions or encouragement, serving as a learning companion as well as a learning assistant. Teachers can also make the most of this feature of AI to expand opportunities for oral practice scenarios. The China International Import Expo (CIIE) recruits volunteers from our university every year. If AI could be used to simulate the exhibition process and the multiple roles in the exposition, students could participate in simulated product and service introduction as well as business negotiations. Through these practices, they would become proficient in using appropriate oral expressions on these specific occasions. Similarly, given that the majority of students in our university major in law, AI could be used to simulate court proceedings and the various roles such as judges, prosecutors, lawyers, plaintiffs, and defendants. Then students could participate in these simulated trial processes, such as prosecution and defense, to become familiar with and master the accurate legal expressions. Besides, they would gain immersive and interactive experiences, engage in diversified oral practice with multiple virtual identities, and upgrade their virtual roles through improved oral skills and problem-solving abilities, thereby acquiring greater enthusiasm for autonomous learning. Subsequently, AI would analyze the oral expressions of each student, adjust the content, difficulty, or path of the simulation process, to gradually improve students' oral and cross-cultural communication skills. More importantly, AI can increase students' opportunities for oral practice, help them better grasp the differences between English and Chinese oral expressions, thus enhancing the conversion rate of oral knowledge into practical oral skills.

4.2 Ensure real-time, friendly, and personalized human-computer interaction

Teachers can interact with Artificial Intelligence to keep track of students' learning progress. Students, through their interaction with AI, can engage in personalized autonomous learning, accessing more customized learning resources and suggestions. Teachers can also, with the aid of AI, design a variety of oral tasks with different levels of difficulty. Students then can autonomously select the tasks that best suit their oral competence and needs for practice. Then AI will provide real-time grading, correction, and guidance for students' oral practice, prompting them to correct errors without delay until the desired standard is reached. Teachers, by accessing the evaluation data generated by AI, can assess students' oral skills and adjust the content of oral English teaching in a timely manner by focusing on common mistakes and weaknesses, showcasing excellent examples of oral practice, discussing and analyzing how to approach oral tasks, and encouraging students to actively participate in oral interactions. This also helps to cultivate students' independent and critical thinking skills. Finally, AI will push automatically generated, personalized consolidation tasks to each student, helping them promptly correct mistakes and overcome weaknesses. Moreover, since AI can handle repetitive tasks in a more friendly and patient manner, human-computer interaction can help students avoid the fear of making mistakes or feeling embarrassed that might occur during real life oral communication. This can give students more confidence and courage, thereby stimulating their interest and motivation to learn and practice.

4.3 Render real-time, objective, and accurate evaluation and feedback

Artificial Intelligence can grade students' oral tasks in real-time, assess the accuracy of their expressions, and correct erroneous pronunciation. This helps students avoid the embarrassment of being corrected in front of a large audience, allowing them to master accurate pronunciation more quickly and with less stress, and boosting their confidence in practicing oral skills.

At the same time, the workload of grading oral assignments for teachers is significantly reduced. This allows teachers to devote more time to assessing the grading data by AI to keep track of each student's oral competence and progress

and providing one-on-one, personalized guidance. AI can also conduct random tests of students' oral skills at any time, analyze the test results in real-time, point out and correct errors in students' oral expressions, and offer tailored learning suggestions, strategies, and plans. It can also push personalized oral learning resources and create individual learning management profiles. A distinctive feature of AI grading is that the oral competence assessment by AI ensures the reliability and validity of evaluation, compensating for the limitations of individual teachers' knowledge levels and subjectivity that can lead to inconsistencies in evaluation. However, teachers can create personalized evaluation criteria for students via AI, thereby fully enhancing their motivation and self-confidence.

Since Artificial Intelligence can evaluate large quantities of oral tasks in real-time, teachers can assign more oral tasks and activities than before. At the same time, they can increase the proportion of formative assessment in the final evaluation and conduct assessment from multiple perspectives and in diverse forms with the aid of AI. This not only allows for an objective and accurate assessment of students' efforts and learning progress but also encourages students to make more efforts in their daily oral practice, effectively reducing last-minute cramming before exams.

Students can, with the aid of AI, clarify their learning objectives based on their interests, needs, and oral competence. After a phase of oral practice, students can take tests offered by AI to obtain evaluation, suggestions, and guidance. They can also acquire personalized learning resources and tasks for the next phase based on the assessment results.

5 Conclusion

The application of Artificial Intelligence in university oral English teaching can expand the resources for oral English teaching and the means of evaluation of oral English competence. AI, based on large databases and large language models, can create virtual oral communication scenarios, enrich students' opportunities for oral practice, and enhance their enthusiasm, confidence, and participation in oral practice. It also helps students customize learning resources and plans to better meet their individual learning needs. Meanwhile, AI provides teachers with support for designing oral English tasks and activities, as well as accessing real-time data on students' oral practice, thus promoting the transformation of university oral English teaching models via real-time interaction among teachers, students, and AI.

Due to the limitations of machine learning content, Artificial Intelligence sometimes may fail to understand certain specific human expressions or emotions. Therefore, teachers should pay attention to students' learning attitudes and emotional changes in oral English teaching. Teachers should also master the functions of various AI technologies, standardize the selection and use of teaching resources, and guide students to actively participate in oral English practice and interaction.

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