Research on the Impact of Artificial Intelligence Digital Technology on the Teaching Mode of English in Vocational Colleges

Ning Zhang

Guangzhou Civil Aviation College, Guangzhou, China
zhangning@gcac.edu.cn

Abstract. This article delves into the impact of artificial intelligence digital technology on the teaching mode of English in vocational colleges. Through literature review, empirical research, case analysis and other methods, this study found that artificial intelligence digital technology not only enriches the teaching resources of vocational college English, but also optimizes the teaching mode, improves students' learning efficiency and interest. This article also proposes innovative points for digital vocational English teaching models based on artificial intelligence, and looks forward to future development trends.

Keywords: Artificial intelligence; Digital technology; Professional English; Teaching mode.

1   Introduction

With the rapid development of information technology, artificial intelligence digital technology has penetrated into various fields, including education. As an important part of cultivating high skilled talents, vocational English teaching has also been deeply influenced by artificial intelligence and digital technology.

The current challenges faced by vocational English teaching include uneven student foundations, limited teaching resources, and a shortage of teaching staff. The introduction of artificial intelligence technology provides innovative solutions to these problems: personalized learning, where AI can customize personalized learning plans based on student abilities, improving learning efficiency. Assisted teaching, AI teaching assistants can provide immediate feedback, reduce the burden on teachers, especially when there is a shortage of teachers. Resource optimization, AI can dynamically generate teaching materials and optimize the allocation of teaching resources. Intelligent assessment, automatic grading of homework, providing learning feedback, and helping students correct errors in a timely manner.

These applications not only improve the quality and efficiency of teaching, but also reflect the research importance and innovation of AI in the field of education. This article will explore this impact in detail, in order to provide new ideas and methods for the reform of English teaching in vocational colleges.

2   Literature Review

Scholars at home and abroad have conducted extensive research on the application of artificial intelligence digital technology in the field of education. From computer-aided language learning (CALL) to intelligent education, artificial intelligence technology has played an important role in teaching resources, teaching methods, and teaching evaluation[1]. As a branch of language teaching, vocational English teaching has also been deeply influenced by artificial intelligence digital technology.

H. Douglas Brown (2013) introduced the principles and applications of computer-aided language teaching (CALL) in his book "Tips for Teaching with CALL"[2]. Tian Zhen and Peng Yajing (2022) published research progress on computer-aided language learning in the context of artificial intelligence (2011-2021)[3]. The results showed that in the context of artificial intelligence, the application of technologies such as virtual reality, remote collaboration, speech recognition, human-machine interaction, and automatic evaluation has led to significant changes in foreign language learning methods. Informal digital learning, intelligent language learning systems, blended learning, data-driven learning, and other topics are hot topics in this field of research[4]. The research has summarized the development trends presented by the widespread application of new technologies in this field.

3   Research Methods

This study adopts methods such as literature review, empirical research, and case analysis to conduct in-depth research on the impact of artificial intelligence digital technology on the teaching mode of English in vocational colleges. By collecting and analyzing relevant literature at home and abroad, this study summarizes the current situation and trends of the application of artificial intelligence digital technology in vocational English teaching[5]. At the same time, through empirical research, this study has conducted in-depth exploration of practical problems in vocational English teaching and proposed corresponding solutions[6].

3.1   Literature Review Method

Firstly, clarify the research topic, search relevant literature through academic databases, set search keywords and time range. Screen literature that meets the research objectives, and summarize, classify, and analyze them to determine the theoretical basis of the study and the gaps in existing research[7].

3.2   Empirical Research Method

Determine research questions and hypotheses, and select appropriate sample groups. The samples can be randomly selected or specific populations. Data collection can be conducted through methods such as questionnaire surveys, interviews, and experi-

ments. Ensure the reliability and validity of data, conduct statistical analysis to validate hypotheses.

3.3   Case Analysis Method

Select representative and research valuable cases. Cases can be successful teaching practices, innovative teaching models, or specific teaching issues. Establish an analytical framework, including case background, problem description, influencing factors, solution strategies, etc. Through in-depth analysis, valuable experiences and lessons are extracted.

4   Research Results

Artificial intelligence technology can enrich vocational English teaching resources in various ways and improve teaching efficiency and quality. The following are the specific application scenarios studied in this project:

4.1   Intelligent Tutoring System

AI tutoring system can provide 24/7 learning support, helping students review and consolidate the knowledge learned in the classroom after class. For example, an AI system called "English Speaking Partner" can engage in dialogue exercises with students, evaluate their pronunciation, grammar, and fluency using natural language processing techniques, and provide real-time feedback.

4.2   Automatic Grading System

AI can automatically grade students' writing assignments, providing feedback on grammar, spelling, and structure. This not only reduces the burden on teachers, but also enables students to timely understand their shortcomings.

4.3   Virtual Language Laboratory

Through virtual reality (VR) technology, students can immerse themselves in a simulated language environment, interact with AI characters, and improve their practical language application abilities.

4.4   Speech Recognition and Natural Language Processing

Through speech recognition technology, AI can help students improve their oral skills. Through natural language processing technology, AI can analyze students' language expression and provide improvement suggestions.

4.5   Data Driven Teaching Decision-making

AI can analyze students' learning data, help teachers understand their learning status, and make more targeted teaching decisions.

These application scenarios demonstrate the potential of artificial intelligence technology in vocational English teaching. By providing personalized and interactive learning experiences, research results show that AI technology can help improve students' learning motivation and English application ability, enrich teaching resources, optimize teaching modes, and improve learning efficiency.

5   Case Analysis

The digital vocational English teaching model based on artificial intelligence can improve teaching effectiveness through the following five innovative points:

5.1   Personalized Learning Path

Implementation method: Use machine learning algorithms to analyze students' learning behavior, grades, and feedback, and create personalized learning plans.

Technical support: Data mining and learning analysis techniques, capable of processing and analyzing large amounts of learning data.

Advantages: Compared with traditional "one size fits all" teaching, personalized learning paths can meet the specific needs of different students and improve learning efficiency.

5.2   Intelligent Interactive Textbooks

Implementation method: Develop interactive textbooks containing AI, such as smart workbooks, that can provide real-time feedback based on student interaction.

Technical support: Natural Language Processing (NLP) and speech recognition technology, enabling textbooks to understand and respond to student language input.

Advantages: Improved student engagement and motivation, while providing teachers with real-time data on student understanding levels.

5.3   Virtual Teaching Assistants and Chatbots

Implementation method: Integrate AI driven virtual teaching assistants to provide students with 24/7 learning support and Q&A services.

Technical support: Based on text and voice interaction interfaces, as well as deep learning algorithms to improve the accuracy of answers.

Advantages: It reduces the burden on teachers and provides students with readily accessible learning support.

5.4   Simulate Working Environment

Implementation method: Create a simulated work environment for students to practice professional English through role-playing and scenario simulation.

Technical support: Virtual reality (VR) and augmented reality (AR) technologies, providing an immersive learning experience.

Advantages: It enhances the sense of reality and applicability of learning, helping students better prepare for the workplace environment.

5.5   Adaptive Evaluation System

Implementation method: Develop adaptive evaluation tools, adjust difficulty based on student performance, and provide customized evaluations.

Technical support: Adaptive learning algorithms that can dynamically adjust subsequent questions based on student answers.

Advantage: Provides more accurate learning assessment, helping students identify and strengthen weak links.

Through these innovative points, the digital vocational English teaching model based on artificial intelligence can provide a more personalized, interactive, and highly applicable learning experience, thereby significantly improving teaching effectiveness.

Taking a certain vocational college as an example, the school has introduced artificial intelligence digital technology in vocational English teaching. By introducing an intelligent speech recognition system, the school has achieved automatic error correction and feedback for students' oral practice; By introducing natural language processing technology and machine translation technology, the school provides students with support in grammar, vocabulary, translation, and other aspects; By introducing an intelligent evaluation and feedback system, the school is able to evaluate students' learning outcomes in real-time and provide specific feedback and suggestions. After a semester of practical application, the English grades of students at the school have generally improved, and their interest and enthusiasm for learning have also been significantly enhanced. After the comparison of various indicators between the CALL assisted teaching class and the non CALL teaching class, the CALL teaching class performed much better in all aspects. As shown in Figure 1:
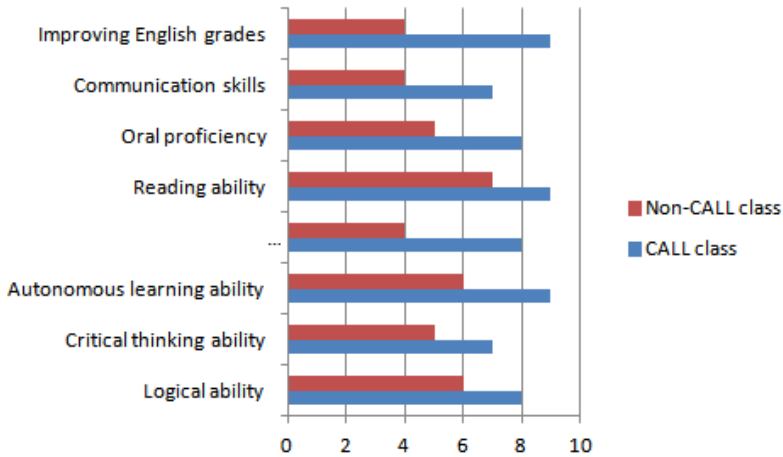
Fig. 1. Comparison of comprehensive abilities between call and non-call classes after one semester

6   Innovation Points

This study proposes innovative points for digital vocational college English teaching mode based on artificial intelligence. Specifically, this model achieves the enrichment of teaching resources, optimization of teaching modes, and improvement of learning efficiency by introducing artificial intelligence digital technology[8]. At the same time, this model also focuses on the personalized learning needs of students, providing precise learning advice and guidance through intelligent evaluation and feedback systems[9]. As shown in Figure 2:
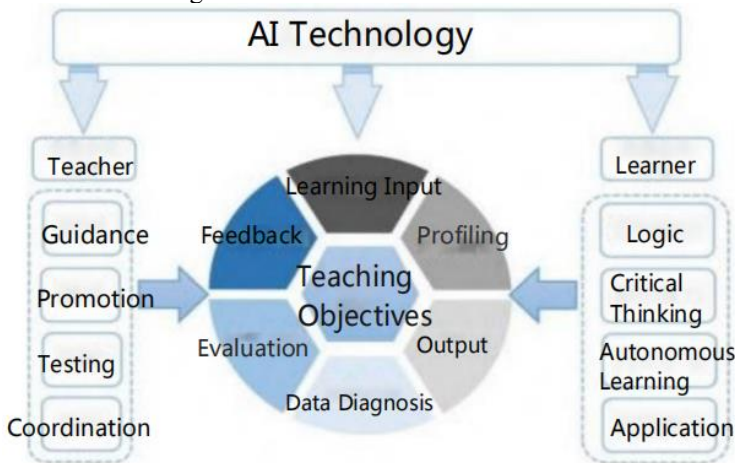
Fig. 2. Interactive Feedback Diagram for Artificial Intelligence Technology Learning

7   Summary

This study delves into the impact of artificial intelligence digital technology on the teaching mode of vocational college English, and proposes innovative points for digital vocational college English teaching mode based on artificial intelligence. In the future, with the continuous development of technology and the expansion of application scenarios, artificial intelligence digital technology will play a more important role in vocational English teaching. At the same time, we also need to pay attention to the potential problems and challenges that may arise during the application of technology, and actively explore solutions to ensure the effective application and development of technology.

Acknowledgement

References

1. Ji Yan's Exploration of English Teaching Innovation from the Perspective of 5G+Artificial Intelligence [J]. Research and Practice of Innovation and Entrepreneurship Theory, 2020, 3 (7): 67-68.
2. Zhao Yitong. The Impact of Artificial Intelligence on the Reform of English Teaching [J]. English Square (Second Edition), 2021, 12:119-121
3. Wen Qiufang. Constructing the theoretical system of "output oriented method" [J] Foreign Language Teaching and Research, 2015, 47 (4): 547-558.
4. Wen Qiufang. Theoretical Framework for the Use and Evaluation of "Output oriented Method" Teaching Materials [J]. Foreign Language Education in China,2017, 10 (2): 17-23.

5. Wen Qiufang. "Output oriented approach" and teaching Chinese as a foreign language [J] World Chinese Language Teaching, 2018, 32 (3): 387-400.
6. Wen Qiufang. Output oriented approach: exploration of theoretical innovation in foreign language education in China [M] Beijing: Foreign Language Teaching and Research Press, 2020.
7. Todd W. Neller. AI education: deep neural network learning resources[J]. Ai Matters ,2017, 3(3):20-21.
8. KJO 'Harai, Computational Notebooks for AI Education [J]. The Florida AI Research Society, 2015,5 (2): 23-28.
9. Natalie Garrett,More Than "If Time Allows": The Role of Ethics in AI Education[C]. AIES '20: Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society，2020（7）272-278.