AI-Empowered Strategies for Aligning Vocational Education English Teaching with Professional Demands

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Abstract： This study focuses on the application strategies of artificial intelligence (hereinafter refered as AI) technology in vocational education English teaching, exploring how AI technology can effectively align English teaching with professional demands. Through methods such as literature analysis and case studies, this paper systematically analyzes the main challenges currently faced by vocational education English teaching, constructs an AI-empowered teaching strategy framework, and proposes concrete implementation pathways. The findings reveal that intelligent curriculum development based on professional corpora, contextualized virtual simulation training, and dynamic competency evaluation systems are key strategies for improving teaching effectiveness. The research results provide theoretical foundations and practical guidance for vocational education English teaching reform. Despite challenges such as high initial investment, data security, and teacher technical proficiency, AI-empowered English teaching holds promising prospects for improving vocational education quality and efficiency.

Keywords: Artificial Intelligence；Vocational Education；English Teaching；Teaching Strategies

DOI： 10.69979/3041-0843.26.01.034

1 Introduction

With the acceleration of industrial upgrading and economic globalization, vocational education talent cultivation is facing new challenges. The Ministry of Education's "Vocational Education Quality Improvement and Excellence Initiative (2020-2023)" clearly states the need to "promote the deep integration of information technology and education and teaching." As the international lingua franca, English holds special importance in the cultivation of technical and skilled talents. However, surveys indicate that vocational college English teaching currently faces widespread issues of disconnection from professional demands.

Vocational education, as an important component of the national education system and human resource development, shoulders the crucial responsibilities of cultivating diversified talents, inheriting technical skills, and promoting employment and entrepreneurship. However, with the rapid advancement of technology and evolving industrial demands, traditional vocational education models have exposed issues such as outdated teaching content, insufficient practical skill training, and difficulty in implementing personalized learning, resulting in a certain degree of disconnection from current social needs. English teaching, being a critical component of vocational education, directly impacts students' comprehensive qualities and international competitiveness. Therefore, exploring the application of AI technology in vocational education English teaching to achieve precise alignment with professional demands has become an important avenue for enhancing vocational education quality and efficiency.

This study explores the specific pathways of AI empowerment from a strategic level, holding significant value for improving the quality of vocational education English teaching and cultivating technical and skilled talents with international competitiveness.

2 Connotation and Characteristics of AI-Empowered Smart English Teaching in Vocational Education

2.1 Connotation

The history of AI can be traced back to the landmark Dartmouth Conference held in the 1950s, which marked the formal establishment of AI as an independent research field, attracting numerous scholars. After decades of evolution, AI has gradually developed from initial theoretical exploration into powerful intelligent systems, deeply integrated into various aspects of contemporary society. Its application scope widely covers areas such as virtual voice assistants, financial data analysis, autonomous driving technology, medical diagnosis support, image and speech recognition, and many more. Compared to early AI systems, contemporary AI demonstrates superior learning capabilities, higher decision-making autonomy, and stronger environmental perception and logical reasoning abilities. In the field of education, typical applications of AI technology include Large Language Models (LLMs), Artificial Intelligence Generated Content (AIGC), knowledge graph construction, and metaverse technologies.

Vocational education is a type of education distinct from general education, holding an equally important position. Its primary goal is to cultivate high-quality technical and skilled talents, focusing on the development of students' practical skills and work capabilities. Vocational education is divided into secondary vocational education and higher vocational education.

2.2 Characteristics

AI-empowered smart English teaching in vocational education presents several advantageous characteristics.

Firstly, it exhibits strong interactivity. Under the influence of AI technology, teachers and students interact and communicate through smart learning platforms, which helps to shorten the distance between them and gradually fosters a good teacher-student relationship, enabling both parties to achieve ideal teaching goals through active communication and effective collaboration.

Secondly, the core of AI-empowered smart teaching lies in the "student-centered" approach. This teaching model emphasizes student

autonomy. In smart platforms and spaces, students are the leaders, while teachers act as guides and organizers, leading students to acquire more valuable English knowledge through smart resources. Different from the traditional teaching model where teachers "actively teach" and students "passively learn," AI-empowered smart teaching requires teachers to fully respect students' dominant position, allowing them to learn English knowledge through autonomous learning and in-depth exploration. On the one hand, this helps to cultivate students' good autonomous learning habits and further develop their core competencies; on the other hand, it enhances the fun of English teaching in vocational colleges, prompting students to shift from passively receiving theoretical knowledge instilled by teachers to actively exploring deeper content behind English knowledge.

3 Application of AI Technology in Vocational Education English Teaching

With the rapid development of AI, numerous domestic studies have emerged on the application of AI in education. AI has been studied to varying degrees in many disciplines, such as ideological and political education, teacher teaching ethics, digital media technology, higher education, medicine, land resource management, etc. However, research on AI in English education and teaching is not extensive, and studies on AI in English teaching at the undergraduate level in vocational education are still lacking. This topic is worthy of in-depth exploration. Currently, applications of AI in vocational education English teaching include adaptive learning systems, intelligent tutoring systems, online education platforms, etc., such as Duolingo's AI dialogue module, Khan Academy's personalized learning system, Quizizz's instant assessment system, IBM Watson's knowledge graph platform, Pepper robots, IXL adaptive learning platforms, and Google Speech-to-Text speech recognition and pronunciation correction systems. AI can provide real-time feedback and personalized tutoring to students in English listening, speaking, reading, writing, and translation through natural language processing and machine learning technologies. AI technology has broad application prospects in personalized learning, teaching resource recommendation, and automated assessment.

3.1 Personalized Learning Portfolios

Driven by data, AI analyzes and predicts student learning by collecting and analyzing their learning data, including homework completion, exam scores, classroom participation, etc., to build personalized learning portfolios. Teachers can gain a more comprehensive understanding of students' learning needs and progress based on these portfolios, thereby providing more precise teaching guidance.

3.2 Safe and Controllable Practice Environments

Through speech recognition and image recognition technologies, AI can create virtual laboratory environments and evaluate students' practical performance based on videos or images, allowing students to practice in safe and controllable conditions. For example, in logistics management, teachers can utilize AI technology to construct virtual warehouses where students can enter training platforms through VR devices to complete tasks such as shelf layout optimization, order batch processing, and emergency response.

3.3 Academic Early Warning and Intervention

Based on big data analysis results, AI can provide early warnings to students with academic difficulties, enabling teachers to take timely intervention measures. This helps teachers to promptly identify students' learning problems and provide targeted assistance and support.

4 Strategy Analysis of AI-Empowered English Teaching Aligning with Professional Demands

4.1 Precise Positioning of Learning Needs

Utilizing AI technology to analyze student data, precisely position learning needs, and tailor learning plans for each student. AI technology can accurately identify students' learning needs and weaknesses through big data analysis. For example, intelligent assessment systems can generate personalized feedback based on students' grammar, vocabulary, and oral performance, helping teachers design targeted teaching plans. Teachers can utilize AI, such as OpenAI's GPT series, to perform language tasks including text generation, translation, summarization, Q&A, etc. It can quickly generate teaching materials such as courseware, exercises, and handouts. Generating relevant text based on specific themes helps teachers save preparation time and improves the diversity and coverage of teaching content.

4.2 Personalized Learning Content Recommendation

AI recommends personalized learning resources based on students' learning needs and interests. For example, intelligent recommendation systems can provide students with English learning materials related to their professional demands, such as industry terminology and professional literature. This helps to enhance students' learning motivation and effectiveness, enabling them to better master English skills relevant to their future careers.

4.3 Intelligent Assessment and Feedback

AI provides real-time assessment of students' learning outcomes through intelligent assessment systems and offers targeted feedback and suggestions. For example, intelligent speech recognition technology can help teachers accurately analyze students' pronunciation problems and provide improvement suggestions. This helps students to promptly understand their learning status and adjust their learning strategies.

4.4 Enhancement of Practical Application Abilities

AI creates immersive language learning environments through virtual reality (VR) and augmented reality (AR) technologies, allowing students to practice listening, speaking, reading, and writing in real-world scenarios. Teachers can utilize VR technology to create virtual business scenarios where students can practice English communication and negotiation in simulated environments. Students can enter virtual teaching scenarios, such as airports, through VR devices and learn as if they are immersed in the environment. During classes, teachers can

utilize VR virtual classrooms for teaching, allowing students to experience the use of tourism English in immersive environments, incorporating English grammar and sentence pattern knowledge during introductions and explanations. Similarly, in the classroom, apart from explaining English and tourism knowledge, teachers can have students act as English tour guides in simulation scenarios and interact with AI robots for practice. This helps to enhance students' practical application abilities, enabling them to better adapt to future career demands.

5 Practical Value of AI-Empowered Smart Teaching in Vocational College English

5.1 Strengthening Students' Core Competencies

Human-computer collaboration is one of the important functions of AI-empowered smart teaching. In the actual teaching process, by utilizing VR/AR technology to create immersive English learning environments and experiential learning atmospheres, students are guided to autonomously watch micro-lecture videos based on their personal interests and learning needs. They learn theoretical knowledge through simulated tests and practice language skills through human-computer dialogue. For vocational college English students, the formation of good subject competencies is not achieved overnight. It requires continuous learning and repeated practice to gradually develop cultural understanding, practical innovation, and humanistic scientific spirit. Traditional offline classroom-dominated English teaching models can only effectively convey basic theoretical knowledge but lack sufficient space, time, and resources to cultivate students' language expression skills and cultural accomplishments. However, AI-empowered smart teaching possesses abundant valuable teaching resources. Through smart platforms, human-computer interaction is achieved, which not only enhances oral language skills but also expands the depth, breadth, and scope of English knowledge learning, laying a solid foundation for the development of students' comprehensive competencies.

5.2 Achieving Cross-Disciplinary Integrated Education

With the increasing frequency of cultural exchanges, internationalization has placed higher demands on the comprehensive competencies of English talents. Traditional single-skilled talents can no longer meet the needs of international cultural exchanges. To spread the voice of China and Chinese stories to every corner of the world, it is necessary to cultivate more high-quality cross-disciplinary integrated talents. This requires vocational college English teaching to break down the limitations between the English subject and other disciplines, transforming a single English knowledge system into a comprehensive knowledge system. AI-empowered smart teaching provides strong support for the successful achievement of cross-disciplinary integrated education goals. In the teaching process of planning and designing teaching plans and activity forms, teachers can select intelligent language learning Apps or English MOOC platforms based on the content of textbooks. With diversified carriers such as video, audio, and pictures, guiding students to learn English knowledge can strengthen the effectiveness of cross-disciplinary and cross-field integrated education, promoting students' innovative development in an entertaining learning environment.

6 Implementation Pathways

6.1 Implementation Pathways

6.1.1 Strengthening AI Technology Infrastructure

Government, schools, and enterprises should jointly undertake the high initial investment, strengthen AI technology infrastructure, and provide necessary hardware and software support for English teaching. First, constructing smart classrooms and equipping VR devices. Encourage enterprises and scientific research institutions to develop AI-empowered English teaching platforms and tools to improve teaching efficiency and effectiveness. Second, develop intelligent assessment systems and personalized learning recommendation systems.

6.1.2 Optimizing and Perfecting the English Curriculum System

A comprehensive and systematic English curriculum system is the foundation for the smooth implementation of AI-empowered smart teaching. Vocational colleges should combine the individualized requirements of the international community for English talents to optimize and perfect the traditional single curriculum system. Guided by the concept of "professional integration + quality development," they should establish a modular curriculum system. On this basis, they should scientifically design teaching objectives and reasonably select teaching content. In designing the teaching objectives of vocational English courses, quality education should be taken as the entry point, and course objectives should be closely linked to core competencies. The new curriculum standards clearly propose that the core competencies of vocational English are reflected in four dimensions: workplace foreign communication, multicultural exchange, language thinking improvement, and autonomous learning improvement.

7 Case Study

Taking the "Airport Travel English Introduction" course for the tourism English translation major in vocational colleges as an example, the following demonstrates the teaching process assisted by AI technology. The vocational college applied English major differs from the traditional research-oriented university English major in curriculum setup and talent cultivation objectives. The vocational college applied English major aims to cultivate new-era English talents who can engage in high-level, complex professional communication in the actual workplace. It focuses on the combination and application of English with various vocational skills. Tourism English is a practical core course that combines English with tourism. The following demonstrates the entire teaching process from lesson preparation to conclusion for a 45-minute class on the topic of "Airport Travel English Introduction," incorporating AI technology.

Firstly, both teachers' lesson preparation and students' preview can utilize the data resource library on the AI platform to read and watch auxiliary materials introducing various airport processes in Chinese and English. Teachers can input instructions into the AI platform to write lesson plans based on the text content.

Secondly, during the lesson preparation process, teachers can input the entire text into the AI platform to generate courseware. The AI platform, which only processes text information, can generate the main content of the courseware. Teachers can then add their own characteristics and create personalized courseware based on student needs and AI instructions. The images and videos required for the courseware can also be generated by inputting instructions into the AI platform.

During the class, teachers can utilize a VR virtual classroom to create an immersive learning environment for students through virtual reality technology, making the learning of travel English more vivid and interesting. Students can enter virtual teaching scenarios, such as airports, through VR devices and learn as if they are immersed in the environment. During the class, teachers can utilize the VR virtual classroom for teaching, allowing students to experience the use of tourism English in immersive environments. Teachers can incorporate English grammar and sentence pattern knowledge during introductions and explanations. Similarly, in the classroom, apart from explaining English and tourism knowledge, teachers can have students act as English tour guides in simulation scenarios and interact with AI robots for practice.

For the after-class oral and written translation practice assigned by teachers, students can also utilize the AI platform and VR virtual classroom. The personalized learning experience and practice can be tailored to students' learning abilities and interests, allowing them to choose learning content and difficulty levels independently for interactive learning. Difficult and key grammar sentence patterns can be repeatedly viewed and practiced. This personalized learning method can be controlled by students themselves, and they only need to take a test at the end. During the practice session, errors in oral and written translation exercises will be automatically collected and fed back by automated assessment tools utilizing AI technology, providing students with personalized suggestions and answers. Finally, AI technology can perform personalized and collective data analysis on students' practice, which can be visually interpreted through various data charts. After the empowerment of AI in English teaching, there is still unlimited exploration and development space in all aspects of the entire vocational English teaching process.

8 Conclusion

AI-empowered vocational education English teaching has broad prospects for aligning with professional demands. By adopting strategies such as precise positioning of learning needs, personalized learning content recommendation, intelligent assessment and feedback, enhancement of practical application abilities, and promotion of teacher-student interaction and communication, AI technology can significantly improve the quality and efficiency of English teaching. However, challenges such as high initial investment, data security, and teacher technical proficiency still exist in the implementation process. In the future, with the continuous development and application of technology, AI-empowered English teaching will help to improve the quality and efficiency of vocational education and cultivate more high-quality skilled talents who meet social needs.

9 Funding

This research was supported by the Jilin Provincial Research Program for Teaching Reform in Vocational and Adult Education, under the project titled "A Study on Strategies for Aligning AI-Empowered English Teaching with Professional Requirements in Vocational Education" (Project No. 2025ZCY342).

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