



# The Application of RAG in Higher Vocational English Education in the Intelligent Era

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**Abstract.** In the face of the rapidly changing digital technology, vocational college English major education should actively explore new teaching methods with the assistance of artificial intelligence technologies, like AI Agents and RAG, and introduce the latest digital technologies like AIPE from industry enterprises, thus to improve the integration mechanism between the industry and college. In this way, it can effectively enhance the teaching effectiveness in English major classes and improve students' language application abilities, continually broaden students' employment possibilities, and provide new impetus for the reform of vocational English education.

**Keywords:** RAG Technology; Vocational education; AI Technology application; English Major Education

## 1 Introduction

Faced with the wave of industrial digitization, artificial intelligence (AI) technology has brought a significant impact on English teaching and talents cultivation. Currently, most traditional industries are strongly influenced by AI technology, therefore only mastering English language skills is no longer sufficient to meet enterprises' demands. Considering the wide usage of AI techniques in future workplace and the goal of cultivating high-quality skilled talents, it is crucial to actively explore feasible ways to apply AI technology in vocational English major education, and adopt innovative educational methods as well as AI technologies in teaching practices, in order to enhance the students' comprehensive technological application abilities, expanding their future employment pathways.

## 2 Research Background

Currently, both domestic and international scholars have achieved substantial academic results in the field of AI-assisted teaching. Tang Linwei and Li Xiaoqiu<sup>[1]</sup> outlined the theoretical foundation of "AI+" professional courses from a micro perspective, An Xin et al.<sup>[2]</sup> explored the challenges of technology application in AI-integrated English

teaching from the perspective of teachers based on empirical data gathering. In addition, studies related to ChatGPT in second language writing<sup>[3]</sup> and AI-assisted post-editing<sup>[4]</sup> are emerging continuously, for example Zhang Zhenyu and Hong Huaqing<sup>[5]</sup> focused on exploring the beneficial applications and challenges of ChatGPT in foreign language teaching. Regarding to higher education's digitization studies, Jin Liang and Yang Jinsong<sup>[6]</sup> discussed the reform paths of vocational courses using foreign language courses as an example, Jin suggested that with the help of AI technologies, higher vocational courses should focus on individual needs and break the time and space constraints, and turns the traditional instructional classes into experimental and interactive courses. In international conferences, Jiang Rongcheng<sup>[7]</sup> discussed the challenges of AI technology in vocational education, like data privacy, algorithmic bias and problems like lack of financial funds, as well as opportunities like widespread computers in colleges, while Feng Hui<sup>[8]</sup> focused on the negative impact on vocational talents education and the countermeasures.

However, there is little micro and concrete research on how higher vocational college English education can adopt AI technology and enhance the students' language and technical application skills. This article analyzes the current shortcomings of higher vocational English education concisely, and proposes concrete ways to implement AI technologies, like AI agents and RAG technologies, in vocational English education to improve students' technical application abilities, aiming to elevate the level of higher vocational English education and promote personalized learning and comprehensive development for students.

### **3 Current Dilemmas of AI Empowering Higher Vocational English Education**

At present, the application of AI technology in vocational college English major education still faces many challenges and shortcomings. These issues involve multiple dimensions, including technology compatibility, students AI competence, and school-enterprise cooperation and so on.

#### **3.1 Students' Weak Ability to use AI tools**

According to the surveys taken in vocational colleges some students lack adequate self-learning abilities and a proactive exploration spirit, making it difficult for effective learning. For example, some students show excessive dependence on AI tools for instant translation, grammar correction, and other functions. This will result in a lack of deep reflection on improving their own language expressions, limiting their creative and critical thinking ability to learn beyond the words, vocabulary and grammar. Furthermore, some students have insufficient digital literacy skills, preventing them from judging AI-generated content with a dialectical and rational perspective.

### **3.2 Poor Compatibility of AI Tools**

Some higher vocational colleges have shortcomings in hardware facilities, such as outdated computer equipment and insufficient network bandwidth, which cannot meet the basic requirements for AI technology operation. Many AI tools still have technical compatibility issues with the teaching platform. As a popular digital learning platform in China, Chaoxing Xuexitong Platform has the AI agent problem. “Xiaoxing”, the AI agent embedded in Xuexitong, can not offer a satisfactory performance for English learners, since its English audio recognition accuracy is quite low, while some excellent AI voice recognition tools, like Talk AI, Hi Echo (Youdao) may not be able to integrate into the existing online learning platforms, resulting in various inconveniences for the users.

### **3.3 The Gap between College’ Teaching Resources and Industrial Technical Needs**

Many industry-specific English case studies and practical translation information are confidential, which is inappropriate to use online AI agents for suggestions, therefore it needs high-quality local industry case databases or corpus for reference. In addition, issues of data security and privacy cannot be overlooked. Many AI engines require large amounts of information and data to generate proposals and plans, but there are security risks in business data collection, storage and usage, especially for the translation service of confidential business information.

## **4 Application Paths of AI Technology in Higher Vocational English Teaching**

Based on the employment-oriented nature of vocational English education, vocational colleges should actively integrate cutting-edge technologies from industries and enterprises in the teaching reforms, flexibly adjusting the design of professional teaching content to meet the demands of the labor market, improving students’ AI application abilities, and enhancing their future employment possibilities. As for the challenges mentioned above, there are some proposals and suggestions:

### **4.1 Using AI Agents Reasonably to Improve Students’ Learning Efficiency**

In recent years, generative artificial intelligence tools represented by ChatGPT, including major domestic tools like Baidu Wenxin Yiyan, Xinghuo Large Model, Zhipu Qinyan, Tongyi Qianwen, Moonshot Kimi, Doubao, DeepSeek and so on, have been continuously updated and iterated, providing strong technical support for autonomous learning. However, the rational use of AI technology in English learning is of great importance. Therefore, we need to guide the students in the way of using AI tools, to establish a correct view of scientific and technological ethics. Besides, the students

should be encouraged to think independently and critically, and learn to integrate the information offered by AI agents, and improve the feedback based on human being's comprehensive thinking ability. In this way, AI large models can help students efficiently meet their diverse learning needs of students. All in all, the reasonable use of AI technology in English learning not only stimulates students' exploration motivation and learning interest, but also injects new vitality into English teaching practice in the classroom, helping English learners improve their learning outcomes.

#### **4.2 Using independent AI Agents as Virtual Speaking Companion and Online Teaching Assistant**

By simulating real teaching scenarios, AI technologies can help students engage in interactive dialogues between different roles, mimicking real English work environments such as business meetings and cultural events, assisting students in better understanding key vocabulary, common expressions and grammar rules in business situations, thereby enhancing students' engagement in learning and improving their language application skills and innovative thinking abilities. Second, AI learning APPs like Talk Buddy, Talk Me, Call Annie, Youdao Dictionary and Talk AI can provide English voice recognition and intelligent translation functions, offering strong support and assistance in speaking and listening practices for English majors, and helping them master pronunciation techniques and speech rhythms. In addition, AI tools can act as "virtual teaching assistants" during students' autonomous learning processes, providing 24-hour online tutoring and technical support. Finally, AI technology can be used to simulate English learning situations, and engaging in inquiry-based learning, as well as project-based learning, which can both stimulate students' innovative thinking, encouraging them to creatively tackle problems in work scenarios and enhancing their innovative abilities.

#### **4.3 Using AI Agents and RAG to Overcome Data Linkage and Promote College-Enterprise Integration**

higher vocational colleges should actively carry out college-enterprise cooperation and establish in-depth partnerships with local companies. By hiring industry mentors to review and suggest teaching standards, course content, and teaching schedules for professional courses, as well as inviting enterprise mentors to provide teaching feedback. In this way, colleges can enhance their academic programs and better suit the students' needs.

Regarding the construction of professional courses, higher vocational colleges can actively develop relevant specialized and elective courses focusing on artificial intelligence technology. For example, setting up translation courses like "Introduction to Translation Technology" "Translation Project Management" in English majors to cultivate students' abilities in providing language services. By adopting enterprise tasks into the teaching process, the students can learn how to solve real tasks such as terminology translation or corpus building and processing.

As we have mentioned above, there is still great gap between the teaching contents and industrial needs, as well as potential data linkage issue. To overcome the gap and data linkage problem, we can adopt RAG technologies into the translation courses to practice real enterprise translation tasks. Generally speaking, to build a vertical domain-specific local knowledge base system, we need to implement a standardized deployment process based on a certain industry field, which mainly includes five stages: server environment preparation, Docker component deployment, model service configuration, knowledge base construction, and testing.

First, we need to remotely connect to the server (such as a public cloud or physical server) via SSH protocol and execute the standardized environment construction steps. Then, we can use this command (`systemctl enable --now docker`) to set the Docker service to start automatically; then we can download the Docker Compose binary that matches your system architecture and grant execute permissions.

Second, after the environment preparation is complete, we need to enter the workspace initialization phase, and create the project root directory to download the core configuration file and container definition file. The latter integrates the pgvector extension with PostgreSQL to support vectorized data storage. During the parameter configuration phase, custom adjustments need to be made to the container network environment and security policies. When the container starts, we need to execute the deployment command to create associated service instances.

Third, when the system functionality configuration is completed, we need to set up the business logic settings through the web management interface. Firstly, to access the OneAPI management endpoint to add dialogue models (such as GPT-3.5) and embedding models (such as Sentence-BERT). The former enables natural language interaction capabilities, while the latter generates semantic vectors for knowledge text to support similarity retrieval.

Fourth, we need to enter the FastGPT to create a knowledge base, and set segmentation rules and model association strategies, and then construct a knowledge base through file import (PDF/Word/TXT) or bulk entry via API. Then the system can automatically parse the content and establishes vector indexes. When creating a local knowledge base intelligent engine application, you need to select the dialogue model and knowledge base, define interaction templates in the prompt box (for example, "Please respond based on the knowledge base content, and if not sure, suggest professional books or articles for further consultation"), and verify the accuracy of the response logic through the built-in testing window.

Finally, we need to load testing tools, such as wrk, to simulate high concurrency scenarios to monitor container resource usage for performance tuning. After testing, this deployment solution achieves service isolation and elastic scaling through containerization technology, ensuring that the enterprise-level knowledge base system meets the technical requirements for security, stability, and maintainability. In this way, we will solve the data linkage problem, and offer better translation service for the companies based on AI tools and professional knowledge base, as well as professional corporates.

## 5 Conclusion

Under the background of educational digital transformation, the application of artificial intelligence technology will bring revolutionary changes to the field of vocational education. By reasonably utilizing AI technological means like RAG, we can better serve the companies, and at the same time enhance the technical application ability of English majors, thus promote their practical learning ability and overall development..

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