



# Application Difficulties and Optimization Strategies of Artificial Intelligence Empowering College English Teaching

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**Abstract:** The rapid development of artificial intelligence technology has brought profound changes to college English teaching. Represented by generative artificial intelligence technologies such as DeepSeek, Doubao, and Jimeng, AI is gradually penetrating various aspects of college English teaching, including classroom instruction, writing guidance, oral training, and teaching evaluation. It has further enriched teaching resources, expanded teaching scenarios and modes, promoted the transformation of traditional teaching from standardization and uniformity to personalization and diversification, and effectively improved teaching efficiency. However, in the specific practice of colleges and universities, practical difficulties still exist, such as superficial application, insufficient adaptability, students' abuse of AI tools, and misconduct in data security and ethics. Based on this, this paper, grounded in the practice of college English teaching and adopting a problem-oriented research method, proposes optimization strategies from four dimensions: technology, teaching, teachers, and systems, in response to the above difficulties. It is hoped that this study can provide certain references for colleges and universities to make full and effective use of artificial intelligence technology and promote the high-quality development of college English teaching.

**Keywords:** college English teaching; artificial intelligence; application difficulties; optimization strategies

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## 1. Introduction

China attaches great importance to the integrated development of artificial intelligence and higher education. From the Action Plan for Artificial Intelligence Innovation in Higher Education Institutions to the Master Plan for Building an Education Powerhouse (2024–2035) and the Opinions on Deeply Implementing the “Artificial Intelligence +” Initiative, increasing emphasis has been placed on promoting teaching reform in colleges and universities through artificial intelligence and driving the intelligent and personalized development of foreign language education through technological empowerment. College English is an important foundational discipline in higher education, possessing both instrumental and humanistic characteristics, and serving as a key carrier for cultivating students' language literacy and intercultural communication competence. For a long time, college English teaching has generally adopted large-class instruction, single teaching modes, and weakened oral training, making it difficult to meet the needs of college English teaching in the new era.

In recent years, with the rapid development of artificial intelligence technology, new ideas and tools have been provided for addressing the pain points of college English teaching in colleges and universities. At the same time, the characteristics of language teaching itself are naturally compatible with artificial intelligence technology. Technologies such as natural language processing, virtual reality, and generative AI can be comprehensively integrated into the entire process of pre-class, in-class, and post-class English teaching, effectively enriching teaching modes, expanding teaching scenarios, and improving teaching experiences. However, in specific practice, the application levels among colleges and universities vary greatly, and problems such as insufficient technological adaptability and limited integration depth still exist, failing to achieve the expected goals. This paper aims to deeply analyze the difficulties in AI application in college English teaching and propose optimization paths to help improve the quality and efficiency of classroom teaching.

## 2. Analysis of the Advantages of Artificial Intelligence Empowering College English Teaching

### 2.1 Breaking the Constraints of Time and Space and Promoting Teaching According to Students' Aptitude

Traditional college English teaching mostly adopts large-class instruction, combining multiple classes of similar majors and using general teaching materials and resources, which resembles the teaching model of high schools. Classroom resources are limited and teaching is mainly one-way knowledge infusion, making it difficult to meet the current diversified

and personalized learning needs. Artificial intelligence technology empowering English teaching can build a full-chain educational system covering pre-class, in-class, and post-class teaching. Before class, preview resources can be pushed through the cloud according to majors and levels, and pre-class tests can be organized in advance. During class, the system can customize teaching content according to students' abilities and enrich classroom interaction forms. After class, platforms can be used for review and autonomous learning.

## **2.2 Accurately Analyzing Learning Conditions and Realizing Personalized Teaching**

Relying on artificial intelligence technology, various data information from students' pre-class preparation, in-class answering, after-class assignments, and stage tests can be comprehensively collected to understand students' knowledge mastery, distribution of wrong answers, and accurately locate weak learning links. Based on students' big data information, student learning profiles can be established to provide a basis for hierarchical teaching and personalized teaching. According to students' learning conditions, the platform dynamically adjusts pushed content and customizes personalized learning materials to realize precise teaching.

## **2.3 Innovating Interactive Scenarios and Solving Problems in Oral English Teaching**

Oral English has always been a weak link in college English teaching. Classroom interaction scenarios are limited and the number of students who can practice is restricted, making it difficult for students to receive effective training. Moreover, autonomous practice after class cannot obtain professional guidance. Relying on mature software or efficiently self-developed platforms such as Keli Oral English, Hi Echo Oral Coach, and TalkAI, scenarios such as daily communication, business communication, professional English, and academic defense can be simulated. Human-machine interaction can realize real dialogues and provide stress-free, all-weather conversational practice. The system can correct errors in real time, collect information, and provide targeted exercises.

## **2.4 Reducing Teachers' Burden and Improving Teaching Efficiency**

The application of artificial intelligence can realize repetitive and basic tasks such as automatic assignment grading and teaching material generation, thereby reducing teachers' workload and enabling them to devote more time and energy to high-value tasks such as instructional design, classroom teaching, personalized guidance, and emotional communication, further improving classroom teaching efficiency. For example, AI can instantly grade multiple-choice questions and calculate the accuracy rate, helping teachers quickly grasp students' learning conditions and promptly adjust teaching strategies.

# **3. Practical Difficulties of Artificial Intelligence Empowering College English Teaching**

## **3.1 Superficial Technological Application and Insufficient Deep Integration with Teaching**

At present, many colleges and universities have begun to promote artificial intelligence technology in English classrooms. However, generally speaking, the current stage is still exploratory, with insufficient tool adaptability and inadequate integration with classroom teaching, failing to achieve the expected teaching effects. Most teachers mainly use AI for basic teaching tasks such as courseware presentation, assignment grading, and exercise generation, with limited integration into classroom instruction. Functions such as data collection and analysis, personalized scenario construction, hierarchical teaching, and intelligent interaction have not been fully utilized. In addition, existing AI tools mostly focus on general functions such as text generation and speech recognition, and are unable to effectively cultivate higher-level goals such as students' emotional expression ability and intercultural communication competence.

## **3.2 Abuse of and Dependence on AI Tools, Giving Rise to Various Teaching Drawbacks**

Everything has two sides. The popularization and application of generative AI have improved classroom teaching efficiency, but have also inevitably led to the problem of student abuse. Some students with poor self-discipline directly use AI to complete essay writing, text translation, and exercise answering, which violates the original intention of AI and leads to a reversal of educational priorities. Some students excessively rely on AI tools for oral practice and immerse themselves in virtual scenarios, lacking authentic contexts, interpersonal interaction, and emotional communication. As a result, students' psychological quality and adaptability cannot be effectively trained, and over time, their adaptability and confidence in real conversations may even be weakened. Excessive reliance on human-machine interaction also compresses the offline communication space between teachers and students as well as among students themselves, weakens the humanistic and communicative nature of English courses, and is unfavorable to the cultivation of students' intercultural literacy. Excessive dependence on AI by teachers may also generate psychological inertia and weaken their teaching design and research

capabilities.

### **3.3 Data Security Risks and the Urgent Need for Optimization of Model Algorithms**

The application of artificial intelligence tools generally requires the collection of students' basic information, learning data, and growth experiences, which poses certain data security risks. Some university platforms have low encryption levels and untimely firewall updates, resulting in risks of data leakage, tampering, and illegal abuse. In addition, the underlying model algorithms of current domestic AI English teaching platforms and tools are still imperfect, and their intelligent interaction modes are monotonous, lacking emotional interaction and humanistic guidance, thereby weakening both the improvement of language skills in English teaching and its comprehensive educational value. Finally, regarding the application of artificial intelligence, most colleges and universities currently lack data security regulations and technical ethical standards, and have failed to establish normalized supervision and management mechanisms.

### **3.4 Insufficient Digital Literacy and Inadequate Targeted Educational Training**

Teachers are the main body of teaching activities. The empowerment of college English teaching by artificial intelligence has also put forward new and higher requirements for teachers' digital literacy and comprehensive teaching ability. At present, most college English teachers are professionally trained in English and generally lack digital and information-based competencies. Their familiarity with intelligent platforms is insufficient, and their abilities in data analysis and customization are obviously inadequate. Concepts and ways of thinking related to data-driven instruction, algorithmic logic, and human-machine collaboration have not yet been fully established. In daily teaching, phenomena such as mechanically applying templates, rigid integration, and superficial application are common. The relevant educational training systems in colleges and universities are still incomplete, with generalized content and a lack of specialized training in artificial intelligence, especially in areas such as integrated design, human-machine collaboration, and data analysis. Finally, the current teacher evaluation system lacks sufficient guidance and is not closely integrated with excellence awards, professional title evaluation, and performance incentives, making it difficult to effectively mobilize teachers' enthusiasm.

## **4. Optimization Strategies for Artificial Intelligence Empowering College English Teaching**

### **4.1 Deepening the Concept of Human-Machine Collaboration and Promoting the Deep Integration of AI and Classroom Teaching**

Human-machine collaboration and the deep integration of AI tools with classroom teaching are inevitable paths for educational transformation in the intelligent era. In response to current problems such as superficial AI application, insufficient tool adaptability, and inadequate classroom integration, colleges and universities should proceed from their own realities and, based on existing platforms and resource conditions, build AI classroom teaching systems that fit students' learning conditions and can be implemented on a regular basis. They should establish a teaching framework covering the entire process before, during, and after class to realize deep human-machine collaboration. In the pre-class stage, platform systems should dynamically collect and analyze learning conditions, establish class learning profiles and individual learner models, and, in combination with course syllabi and textbook unit themes, generate textual materials and video teaching resources. Preview exercises should also be released and pushed to students in advance to facilitate pre-class preparation. During the in-class stage, AI platform software should be fully utilized to create teaching situations and interactive scenarios that fit classroom themes and atmospheres. In light of the current situation of large-class instruction and according to talent cultivation objectives, suitable tools should be selected, AI corpora optimized, and content related to cultural communication, situational critical thinking, and emotional expression increased. Feedback should be collected through in-class assessments, bullet-screen interaction, and instant response tools to identify teaching obstacles and blind spots, thereby facilitating adjustments to teaching strategies. In the post-class stage, personalized and hierarchical assignments should be arranged according to students' learning conditions. Intelligent grading and feedback should be conducted, learning diagnostic reports generated, and targeted teaching resources pushed to students, thereby forming a positive closed loop of "data-driven instruction—intelligent feedback—personalized intervention."

### **4.2 Regulating the Boundaries of AI Use and Constructing a Healthy Teacher-Student Application Ecosystem**

The rapid development of artificial intelligence technology has brought new opportunities to college teaching, but has also caused practical challenges such as tool dependence and improper application. In response to problems such as

the excessive use of AI tools and tool dependence among teachers and students, colleges and universities should regulate the boundaries of artificial intelligence use from both student management and teacher management perspectives, so as to construct a healthy intelligent learning ecosystem. On the one hand, at the teacher level, dependence on technology should be strictly restrained. It should be clearly defined that AI serves only as an auxiliary tool for lesson preparation and grading, while teachers must retain core teaching responsibilities such as instructional design, classroom refinement, and learning-condition analysis to avoid teaching inertia. AI teaching research should be further strengthened, and teachers should be regularly organized to exchange experiences and insights in order to improve verification capabilities. Classroom teaching should further balance the proportion of human-machine interaction and offline communication by adding offline interactive activities such as group debates, foreign-language situational dramas, and cultural sharing sessions. In combination with the cultural themes of teaching materials, expanded teaching activities such as Western customs and comparative studies of Chinese and foreign cultures should be carried out to compensate for the shortcomings of AI in emotional communication and humanistic interaction. On the other hand, at the student level, in view of the learning characteristics of contemporary college students and the chaos caused by AI abuse, the use of tools should be regulated from three aspects: classroom management, assignment design, and ideological guidance, so as to create a sound learning ecosystem. Clear red lines for AI tool use should be established, ideological education should be strengthened, and violations such as AI-generated ghostwriting, one-click translation, and plagiarized answers should be strictly prohibited. Assignment design should reduce patterned tasks such as direct translation and complete exercise sets, while increasing practical and open-ended tasks such as classroom speeches, foreign-language research reports, cross-cultural comparative analyses, and situational dialogue recordings to prevent mass AI-generated content. All staged assignments should undergo AIGC plagiarism detection, and once plagiarism is discovered, serious accountability measures should be imposed. Oral English training models should also be further optimized by combining “AI virtual practice + offline real-scene interaction” to enhance interpersonal interaction and on-site adaptability training, improve students’ psychological quality and oral confidence, and avoid the weakening of social abilities caused by long-term immersion in virtual scenarios.

#### **4.3 Strengthening Data Security Control and Optimizing the Ethical Architecture of Underlying Algorithms**

Data security and algorithm ethics are the fundamental guarantees for AI-empowered teaching. In response to data security risks and model algorithm issues in AI-assisted teaching, it is suggested that colleges and universities establish a trinity management system integrating technical support, algorithm optimization, and institutional guarantees, with institutional mechanism construction as the starting point, so as to avoid problems such as data leakage and algorithm bias. First, at the level of technical support, colleges and universities are advised to preferentially select formal platforms registered with the Ministry of Education and possessing high-level encryption protection. The “minimum necessity principle” should be adopted when collecting student data to prevent excessive collection of student information. Sensitive materials such as students’ oral recordings and personal learning archives should be encrypted and backed up, while usage permissions should be strictly limited and regulated to prevent data tampering and leakage. Regular system vulnerability inspections and virus detection should also be carried out. Second, at the level of algorithm optimization, colleges and universities are advised to further strengthen cooperation with third-party platforms, adjust model algorithms, optimize language recognition logic, and explore the addition of modules such as emotion recognition, tone judgment, and humanistic empathy, thereby improving AI’s ability to recognize students’ language emotions, contextual logic, and cultural connotations and maximizing the value of AI tools. Finally, at the level of institutional guarantees, colleges and universities should, in light of their actual conditions, formulate regulations for the use of artificial intelligence in teaching, data security management systems, and technical ethical guidelines, while establishing normalized supervision mechanisms for regular data inspection, risk monitoring, and permission review, so as to avoid security risks and ethical problems at the institutional level.

#### **4.4 Improving Teacher Training and Evaluation Systems and Comprehensively Enhancing Teachers’ Digital Literacy**

In the digital era, teachers’ AI literacy is transforming from an “additional advantage” into an “essential requirement.” In response to problems such as weak digital literacy among English teachers, generalized training, and insufficient evaluation and incentives, colleges and universities should further improve teacher training systems by incorporating more content related to digitalization and artificial intelligence. At the same time, teacher evaluation systems should be improved by increasing the proportion of AI-related teaching content in assessments, fully leveraging the guiding role of evaluations, and encouraging teachers to actively embrace new technologies and improve their teaching abilities. First, colleges and universities should, in accordance with the structural characteristics of the teaching staff, establish a hierarchical and

categorized digital training system. For middle-aged and elderly teachers, lightweight training programs should be organized, focusing on platform operation, resource collection, and basic applications, so as to help them quickly master and integrate into intelligent teaching. For young teachers, advanced workshops should be offered, focusing on in-depth content such as AI instructional design, learning-condition data analysis, generative AI courseware optimization, and human-machine collaborative classroom design, thereby cultivating a backbone team for intelligent education. Second, research on artificial intelligence empowering college English teaching should be strengthened. Through methods such as inter-school cooperation and internal exchange and research, mutual-assistance communities for English teachers should be established, and activities such as collective lesson polishing, teaching salons, and open-class demonstrations should be organized to share teaching cases and classroom experiences and improve teaching quality. Finally, teacher assessment and incentive mechanisms should be further improved by explicitly including AI-assisted teaching within the scope of teacher evaluations and linking it to professional title appraisal and performance assessment, thereby stimulating teachers' enthusiasm for actively applying AI tools and enhancing their digital literacy.

## 5. Conclusion

Artificial intelligence has provided new development opportunities for the reform of college English teaching and reconstructed a new educational ecosystem. Actively embracing AI and enhancing human-machine collaboration capabilities have become inevitable paths for adapting to educational transformation in the intelligent era. In response to current practical problems such as insufficient technological integration, abuse of and dependence on tools, inadequate teacher literacy, and hidden ethical risks, colleges and universities should always adhere to the principle of upholding fundamental values while pursuing innovation, deepen teaching research, strengthen educational training, reinforce the defenses of data security and ethics, continuously optimize intelligent teaching systems, and promote artificial intelligence technology from “technical assistance” to “human-machine integration,” thereby exploring a new path of intelligent college English education with Chinese characteristics.

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