RESEARCH ON THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN PERSONALIZED LEARNING OF COLLEGE ENGLISH

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Abstract

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Tong Lu

Under the Supervision of Dr. Laura Roberts

In the wave of modern educational reform, personalized learning has become increasingly important, but its application in the field of college English education is difficult. Traditional college English education has problems such as single teaching materials and traditional learning modes, which make it difficult to meet the diverse needs of students. With the maturity of artificial intelligence technology, natural language processing, machine learning, and big data analysis have brought new ideas to solve these problems. This article focuses on the application of artificial intelligence in personalized learning of college English. Through a combination of theory and practice, it summarizes the current situation and core technologies of artificial intelligence in English teaching, analyzes the difficulties of personalized learning under traditional teaching modes and the response mechanisms of artificial intelligence, proposes artificial intelligence assisted teaching strategies from the perspective of teachers and students, and explores its technical limitations and optimization directions. Aiming to explore the effective integration of artificial intelligence into college English education, improve students' learning efficiency, promote the modernization and intelligent transformation of education, and provide reference for education policy makers, educational institutions, and technology developers.

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Chapter I Introduction

In the dynamic landscape of modern education, Personalized Learning (PL) stands out as a revolutionary approach. As Walkington and Bernacki (2020) emphasized, PL breaks away from the mold of treating all students equally in the learning process. Instead, it focuses on tailoring educational experiences to each student's distinct characteristics. This personalized approach has far-reaching benefits. Zlatarov et al. (2021) noted that it not only boosts student engagement and motivation but also significantly improves learning outcomes. By creating a more interactive and student-centered learning environment, PL allows students to actively participate in their own learning journey, making the educational experience more meaningful and effective. Though personalized learning has been recognized as an effective means to enhance students' engagement, motivation, and learning achievement, it is still hard to apply this approach, especially in the area of university English education. In the global education system, university English education, as a major part of basic education, has long been faced with the problems of single teaching materials, traditional learning modes, and diversified needs of students not being fully met. Traditional English education typically relies on dry textbooks, set progression and classical exam plans, making personalized learning for each student difficult to achieve.

With the development of artificial intelligence technology, especially the continuous maturity of natural language processing, machine learning and big data analysis, the application of AI in English education provides new ideas to solve these problems.

Recent studies from the US, China, and India highlight that Artificial Intelligence can effectively track and record various learning characteristics of students, providing

recommendations for appropriate teaching and learning strategies tailored to an individual's specific learning traits (Liang & Hainan, 2019). Artificial Intelligence can not only effectively analyze students' learning and understand their individual needs, but also provide tailor-made learning solutions through intelligent algorithms to achieve truly personalized education. The introduction of AI technology, especially in university English teaching, has provided students with more flexible ways of learning, not only by recommending resources according to the learners' interests and abilities, but also by giving real-time feedback on their learning progress and helping them to overcome learning difficulties. At the same time, teachers can also use AI technology to analyze teaching effects, optimize teaching strategies and improve teaching quality. However, the use of generative AI such as ChatGPT, Wenxin Yiyan, and Deepseek is generally insufficient in China, and is often used only as a tool for generating text. This paper provides an in-depth analysis of the use of AI in various aspects of the English learning process in order to provide a reference for personalized English learning.

This study focuses on the application of Artificial Intelligence in personalized teaching of university English, and systematically analyses the empowering paths and implementation strategies of AI technology in university English teaching through a combination of theoretical and practical methods. The study covers the following dimensions: firstly, sorting out the current status and core technology of AI application in English teaching; secondly, analyzing the difficulties of personalized learning in the traditional teaching mode and the coping mechanism of AI technology; lastly, proposing the specific strategies of AI-assisted teaching from the perspective of both teachers and students and

exploring its technical limitations and future optimization direction. Through this study, I aim to explore how AI can be effectively integrated into university English education to enhance students' learning efficiency and drive the modernization and intelligent transformation of education.

Statement of the Problem

My core research question is as follows: How can teachers effectively use AI to personalize university English teaching, overcome challenges in traditional models, and improve teaching outcomes?

Key Issues:

1. What are the difficulties of personalized learning in English based on traditional teaching methods?

2. In what ways can AI be used to assist students in overcoming common learning barriers?

3. How can college English teachers leverage AI tools to improve overall teaching effectiveness?

4. What are the technological and practical limitations of AI in personalized English education?

Definition of Terms

1. Personalized Learning Approach: Personalized learning is an educational approach that tailors instruction to meet each student's unique needs and goals through a process of self-organization and customized teaching. Drawing on research by Chatti (2010) and Miliband (2006), this method involves learners actively shaping their own educational

experiences.

2. Personalized Learning Approach: Personalization entails adapting learning content to align with students' interests beyond the classroom, making learning more relevant and engaging (Walkington & Bernacki, 2018, p. 406).

3. Artificial intelligence: Artificial intelligence is a multi-faceted area of study and practice. It focuses on systems that collect information from their environment and act appropriately based on that input. There are four main approaches within AI. The first is mimicking human actions, as evaluated by the Turing Test; the second involves replicating human thought processes through cognitive modeling; the third is reasoning logically according to established principles; and the fourth is making rational decisions via the design of intelligent agents (Russell & Norvig, 2020, p. 2).

AI is also a field of science and engineering centered around creating intelligent machines, especially computer programs with advanced capabilities. Although it is related to using computers to analyze and replicate human intelligence, its methods are not restricted to those inspired by biology (McCarthy, 2007, Introduction section, p. 1). In essence, AI encompasses a wide range of techniques for developing systems that can interact with their environment in intelligent ways, whether by emulating human-like behavior and thought or through non-biologically-inspired computational strategies.

Purpose of the Study

The aim of this study is to explore the effectiveness and strategies of Artificial Intelligence applied to personalized learning in university English education. With the inadequacy of traditional English teaching models in meeting students' individual needs, AI

technology has brought new opportunities to the field of education, especially in the design of personalized learning paths and teaching optimization.

Specifically, the objectives of this study include: firstly, to analyze the current status quo and core technology of the application of AI in English teaching; secondly, to explore the difficulties of personalized learning under the traditional teaching mode, and to study how AI technology can provide students with tailor-made learning solutions; and lastly, to put forward the specific application strategies of AI in university English teaching to help teachers optimize their teaching methods and enhance their teaching effects.

Significance of the Study

This study has important theoretical significance and practical value. Firstly, at the theoretical level, the current research on the application of Artificial Intelligence in university English teaching is mostly focused on the basic education stage, and there is a relative lack of systematic research for higher education scenarios. By deeply exploring the application of AI technology in personalized teaching of university English, this study fills the research gap in this field and provides a new perspective on the theoretical framework of AI-enabled language education.

On a practical level, this study will not only provide teachers with specific strategies on how to effectively use AI technologies in the classroom, helping them to optimize their teaching design and improve their teaching effectiveness, but also provide students with learning paths that are more in line with their learning needs and interests, thus improving their learning efficiency and motivation. The results of this study will provide valuable references for educational policy makers, educational institutions and technology developers,

and promote the further development of university English education in the direction of intelligence and personalization.

Methodology

This study will rely on library research to explore the application of Artificial Intelligence in enhancing personalized learning of English at university. The study will conduct an extensive literature review to review research findings on the use of AI in education, particularly in English language teaching and learning. Literature sources will include peer-reviewed academic journal articles, case studies, conference papers, and books on AI and personalized learning, and language learning. The focus of the review will be to identify the current status of the application of AI technologies in educational settings, the main trends, and the challenges faced, particularly in terms of the impact on personalized learning. Based on the analysis of the literature, the study will summarize the findings and identify how AI can enhance the personalized learning experience in university English education.

Chapter II Review of Literature

In the ever-evolving landscape of education, personalization has emerged as a crucial element. Educators strive to meet the diverse needs of learners through various means, and concepts such as "personalized education," "tailoring educational content," and "adaptive learning" are often used synonymously to describe these efforts (Mohammad Ali, 2023). That is to say, in modern education, the emphasis is on customizing educational experiences to fit each learner's unique requirements, whether it's adjusting the curriculum, teaching methods, or the pace of learning.

Currently, the education sector is undergoing continuous transformation. Amidst this revolution, the integration of artificial intelligence (AI) and English language teaching has drawn significant attention. The implementation of AI technology has opened up new means of enhancing English language skills. According to Fitria (2021), integrating language literacy with digital literacy has the potential to enhance global competence considerably. Briefly, today, students need to be highly skilled with language skills and digital tools if they are to perform well internationally. English, being a world language, when learned with the assistance of AI can better equip students to communicate and collaborate on the global level.

This intersection of AI and English language learning not only brings forth new models and possibilities but also raises a chain of issues needing careful scrutiny. As Chatterjee and Bhattacharjee (2020) pointed out, AI has the potential to create more engaging and effective personalized learning experiences.

This chapter centers on AI-enabled personalized teaching of college English. It will elaborate in detail the current situation of AI application in college English teaching, explore

practical application approaches, and examine its limitations. The purpose is to offer an overall and indepth reference for supporting the development of personalized teaching of college English.

The Current State of Research on Artificial Intelligence-enabled English Language Education

Current Status of Artificial Intelligence in English Teaching and Learning

Nowadays, all types of mass AI learning tools and platforms, such as ChatGPT, Grammarly, Duolingo, have been deeply embedded in the learning process, becoming an inevitable and integral link between teachers' creative pedagogy and students' enhanced learning experience. They have greatly enriched the dimension and breadth of teaching resources by providing personalized learning experiences, intelligent assessments and interactive functions.

Regarding the prevalence of AI use in classrooms, there are several surveys that provide insights. A Wiley's (2024) report titled “Higher Ed's Next Chapter 2023-2024: Four Trends In The Learning Landscape” indicated that 58% of the surveyed university teachers and their students had already used generative AI in the classroom. The survey, which included responses from 1,078 teachers from different disciplines in North America, also showed that over 60% of the teachers were somewhat or very familiar with generative AI tools. Similarly, the Teacher Confidence Report 2024, published by Houghton Mifflin Harcourt, shows that 75 percent of educators believe that AI has some value to them in doing their teaching. As these reports indicate, the popularity of these tools and platforms is steadily increasing.

Further, an increasing number of educational institutions and teachers are recognizing their potential and incorporating them into their teaching practices. They serve as powerful

teaching aids, enhancing the overall quality of education. A study by Zhang and Li (2023) in "Journal of Educational Technology" pointed out that in language courses, the use of Grammarly has significantly improved students' writing accuracy, as it provides instant feedback, similar to having an individual language tutor available at all times. Moreover, Bhutoria (2022) also proposed that with the support of Big Data analysis, AI can present educational content within an engaging narrative game environment. This approach, known as "gamified learning", encourages students to take a more self-directed approach to learning. In other words, it transforms the learning process into an interactive and enjoyable experience, where students are motivated to explore and discover knowledge on their own. For example, tools like Minecraft Education Edition and Duolingo exemplify this approach, transforming learning into interactive, exploratory experiences.

Artificial intelligence technology has strongly promoted the innovation and change of teaching methods, prompting the teacher community to gradually transform from the traditional role of "knowledge transmitter" to the role of "learning guide." However, there are still a series of challenges in the practice of integrating AI technologies with traditional teaching methods. For example, these questions may include how to integrate AI technology with teaching practices, and how to help teachers and students better adapt to new technologies.

Teachers' and Students' Acceptance and Challenges in Teaching English with Artificial Intelligence

In the field of university English language teaching, the acceptance of AI English language teaching and the challenges encountered show multidimensional characteristics. The findings of Li and Liu's (2022) and Kohnke and Moorhouse's (2022) surveys show that

while the majority of the teachers and students are receptive to AI being implemented in English instruction, there are also shared doubts and worries, which primarily have to do with the level of faith in the effectiveness of AI instruction and the inertia of using conventional methods of teaching.

In terms of the challenges facing technology and teaching, teachers are often faced with the dilemma of how to effectively and efficiently integrate AI technologies into their teaching practices; on the students' side, they need to work on adapting to the new learning paradigm spawned by AI.

Difficulties in Personalized Learning of English Based on Traditional Teaching Methods

Learning Resource Adaptation Dilemma: Lack of Interest and Ability-Oriented Resources

In the process of learning English, students are often faced with the difficulty of obtaining learning resources that suit their interests and ability levels, which is also the primary obstacle to personalized learning of English encountered by students under the traditional teaching mode. Currently, English teaching materials on the market are significantly homogenized, mostly with general content and lack of relevance. Tomlinson (2012) critiques this trend, noting that commercial language materials frequently prioritize standardization over learner diversity, resulting in "one-size-fits-all" resources that fail to engage students or address individual needs (p. 143).When students want to explore a certain topic of interest in depth, or try to sift through learning materials that match their own English proficiency level, they often find it difficult to do so. An article by Liana Heitin (2016) in *Education Week* highlighted the scarcity of quality learning materials tailored for English-language learners. The report emphasized that many available resources lack

sufficient scaffolding to accommodate varying language abilities, forcing educators to create their own materials to meet student needs. With such a lack of resources and a low degree of matching, it is difficult for students to pinpoint the learning materials that meet their needs. Over time, this mismatch erodes motivation: Dörnyei (2020) emphasizes that sustained language learning requires "dynamic alignment between resources, learner goals, and self-identity" (p. 34), a condition unmet in traditional resource frameworks. As time goes by, students tend to feel lost and lose their direction on the road of English learning, and their enthusiasm and motivation for English learning will gradually be eroded.

The learning pace autonomy challenge: stress overload in a passive learning model

Another key dilemma faced by students in the process of personalized English learning under the traditional Chinese English teaching model is their lack of control over the pace of learning. Lesson planning, test scheduling, and homework submission deadlines are all determined by the teacher. Students can only follow the school's teaching schedule, and it is difficult for them to make flexible adjustments according to their actual abilities, knowledge acquisition and learning needs. As Krishnan et al. (2019) showed that English-language learners (ELLs) who repeatedly failed high school exit exams exhibited limited self-regulation skills. These students struggled to control their learning processes, leading to heightened stress and reduced academic performance. Paulo Freire's "banking model" of education critiques such passive learning environments, where students are viewed as empty vessels to be filled with knowledge. This approach can suppress critical thinking and personal engagement, resulting in decreased motivation and increased stress among learners. When students are unable to meet the established teaching schedule, the pressure of learning increases significantly. In such a learning environment, students remain passive for a long

period of time, become physically and mentally exhausted, and their knowledge of the direction of English learning is gradually blurred, so their learning efficiency decreases dramatically, making it difficult for them to achieve the desired learning outcomes.

Lack of personalized learning support: barriers to understanding complex learning content and inadequate guidance

In the process of learning English, students often face difficulties in comprehending part of the content and are often unable to receive personalized guidance and assistance, which is also a major dilemma. Because of the significant differences in learning styles and comprehension abilities of each student, it is difficult for teachers to pay comprehensive and detailed attention to the specific problems of each student under the traditional English teaching model due to the constraints of classroom time and teaching tasks. In the absence of timely and effective guidance, students' English learning process will be in a difficult situation, which not only consumes a lot of time and energy, but also is very easy to get into an impasse due to the blockage of ideas. In such a situation, many students become frustrated and lose their confidence in learning English.

Artificial Intelligence Assisted Personalized Learning of English as a Core Technology

Natural language processing (NLP)

Natural Language Processing (NLP) stands as a pivotal technology within the realm of artificial intelligence for language learning. At its core, NLP enables computers to interact with human language in a more sophisticated way, encompassing understanding, analyzing, and generating language.

Before delving deeper into NLP's impact on English learning, it's important to understand one of its key underlying concepts. Topic models, as Blei and Lafferty (2009) define them, are statistical techniques which apply hierarchical Bayesian analysis to

unannotated documents. They enable us to discover the latent semantic structure of a corpus of documents. That is, topic models go through huge volumes of text to determine what subjects are being discussed, even when the topic is not directly mentioned. This is a fundamental aspect of how NLP makes sense of the vast amounts of text it processes.

In the English learning scenario, the application of NLP technology enables students to obtain real-time language analysis support such as grammatical error correction and word suggestion during the learning process. With the help of this technology, students are able to better correct errors in language learning and gradually improve the accuracy of their mastery of the English language. For example, Zhang and Hu (2024) explored the development of automated grammar checking systems, emphasizing that NLP facilitates immediate feedback on grammatical errors, automated grading, and interactive dialogue systems. These tools not only help learners correct errors, but also increase learner engagement through interactive learning environments. With the innovation and progress of NLP technology, the machine is no longer limited to mechanical knowledge storage and output, but has the comprehension and interactivity, which can provide students with learning aids that are highly suitable for the actual language use scenarios, and vigorously promote the improvement of the efficiency and quality of English learning.

Cognitive Computing

In the vast landscape of artificial intelligence, Cognitive Computing stands out as a crucial and innovative element. It is an integral part of AI systems, playing a pivotal role in transforming the way machines interact with the world around them.

Cognitive Computing is designed to simulate human-machine interactions in a highly sophisticated manner. According to Yasar, Gillis, and Botelho (2023), it enables computer

models to replicate the way the human brain functions when faced with complex tasks. This means that just as the human brain processes text, speech, or images to make sense of information and solve problems, Cognitive Computing-enabled systems can do the same. For example, when dealing with a large volume of text, instead of simply scanning for keywords, these systems can understand the context, infer relationships between ideas, and draw meaningful conclusions, much like a human reader would.

The implications of this technology are far-reaching. In the field of language learning, it can revolutionize the way students interact with educational resources. For instance, intelligent language learning platforms can use Cognitive Computing to understand a student's questions in natural language, provide accurate and context-relevant answers, and even offer personalized learning paths based on the student's understanding and progress.

Machine Learning and Big Data Analytics

Machine Learning (ML) and Big Data analytics, as key technologies, also play an extremely important role in the field of education, especially in English language learning. Machine Learning is an extensively used method in AI. It allows computer systems, programs, or applications to self-learn and improve from data without being programmed (Labadlia & Nedjouai, 2024). Machine learning technology relies on algorithms for in-depth analysis of massive amounts of data, and through continuous self-adjustment and optimization, it continuously improves its predictive capabilities. In the English learning scenario, AI is able to record in detail multi-dimensional information such as students' learning habits, error types, learning progress, etc., and then build a unique learning "portrait" exclusive to each student. By utilizing big data portrait technology to thoroughly analyze learners' individual traits and group clustering patterns, hierarchical classification teaching

can be implemented, teaching weaknesses can be identified, and resource allocation can be optimized (Wang & Yu, 2023). Based on this accurate portrait, the system is able to create highly tailored personalized learning programs for each student.

Big data analytics, on the other hand, provides a powerful mass of information to support personalized learning. Big Data analysis and AI, as major drivers of modern technological advancements, offer a powerful method for "extracting valuable insights from complex, diverse datasets to enhance decision-making through diagnostic, prescriptive, and predictive capabilities" (Al Hadwer, Gillis, & Rezania, 2019).

It is capable of digging deep into the complex mass of learning data and extracting the inner laws, accurately predicting the difficulties and dilemmas that students may encounter in the subsequent learning process. Based on these predictions, educators can implement targeted interventions in advance to help students effectively avoid mistakes.

When the two cutting-edge technologies of machine learning and big data analytics are combined and applied, personalized learning is no longer just a theoretical idea but can be realized under the powerful drive of artificial intelligence, helping to transform education.

Speech Recognition and Speech Generation

Speech recognition and speech generation technologies also provide favorable assistance for English language learning. The working mechanism of speech recognition technology lies in the analysis of sound waves to accurately identify each syllable produced by the student and thus determine the accuracy of his/her pronunciation. Instant feedback and pronunciation correction can be offered to students using AI-supported voice recognition (Hira, Ali, & Bhatti, 2019). For example, Liu (2021) discussed the use of speech recognition technology in college oral English teaching, emphasizing its importance in detecting common

pronunciation problems and offering accurate feedback to students. Likewise, Dennis (2024) examined the influence of AI-driven speech recognition technology on the pronunciation and speaking skills of English and concluded that students who used such technology had considerable improvement in pronunciation. These findings highlight the potential of AI-powered speech technologies to enhance learners' oral proficiency through timely, individualized, and consistent feedback.

Speech generation technology, or text-to-speech (TTS), offers students model English pronunciation, aiding listening comprehension and pronunciation practice. The affordances of TTS technology for L2 pronunciation learning and how TTS can contribute to improving the pronunciation of learners through exposure to model speech were talked about by Gottardi et al. (2022). In addition, their study also found that the use of TTS has also been found to promote learner autonomy and motivation since the learners can practice and receive feedback at their convenience.

Collectively, these technologies provide a complete solution to pronunciation practice, enabling students both to hear and articulate correct English sounds. The instant feedback of speech recognition and the ongoing models of speech generation render the learning of pronunciation an interactive experience that reinforces ongoing improvement in pronunciation ability.

Application Strategies of Artificial Intelligence Technology in College English Teaching

For Teachers

Learner needs analysis. Teachers should learn about the college students' characteristics, English learning history and learning goals, and utilize artificial intelligence to make a foundation for college English teaching plan. Teachers together with machine

learning and natural language processing technology have the ability to profoundly explore students' learning trends, interests and needs. Machine learning has the capacity to track students' learning behavior in real time, covering all dimensions of learning time, content and method. Then, with natural language processing, teachers can precisely analyze students' learning feedback. This comprehensive analysis enables teachers to have a more comprehensive understanding of students' learning needs, so that they can provide them with personalized teaching solutions to stimulate students' interest in learning.

Integration of teaching resources. In teaching practice, teachers have the important responsibility of integrating and categorizing a huge amount of teaching resources. Taking English teaching as an example, teachers need to select content suitable for classroom teaching from a wide variety of English learning materials, such as original English books, English radio programs, English teaching papers and other resources. Relying on AI technology, teachers can use it to analyze the rich and diverse teaching materials in depth. For example, by using intelligent translation and text analysis tools, they can analyze a large number of English original works, extract key content such as vocabulary, grammar knowledge and writing skills that meet the current English level of students, and summarize the most effective teaching methods and strategies.

Teachers can collect and integrate existing teaching resources, including AI platforms, online courses, teaching materials and multimedia materials. For example, teachers can integrate “LAIX” and other applications that include AI speaking assessment functions to provide students with personalized feedback on speaking practice. At the same time, they can also collect a wealth of English-specific online courses, such as “Netease Cloud Classroom”

and “MOOC” platforms, to meet the needs of different students in listening, reading and writing. It is then combined with authoritative English teaching materials to ensure the systematic nature of the teaching content. Multimedia materials such as original English movie clips and English songs are integrated to create an immersive learning atmosphere. Through this all-round integration of resources, the diversified learning needs of learners can be effectively met, which strongly promotes the improvement of teaching quality and learning effect.

Teaching assessment and feedback. In the realm of education, the concept of assessment holds significant importance. As Angelo and Cross (1993) pointed out, assessment is essentially the process of gathering relevant information, interpreting it, and then using this interpreted information to enhance understanding and boost performance (p. 4). To put it simply, assessment serves as a crucial tool in the hands of teachers. They utilize it to collect essential data about students, which in turn helps them decide on the most appropriate actions to elevate the quality of the learning experience.

Nowadays, with the advancement of technology, teachers have new and powerful tools at their disposal to conduct more effective assessments. Firstly, they can leverage big data analysis technology and natural language processing (NLP) technology to build comprehensive evaluation models. These technologies enable teachers to collect and analyze large sets of data generated during students' learning processes. Let's take English reading teaching as an example. Learning platforms can track several data points about students' reading activities. These are the time spent by the students reading English articles, the frequency with which they click to check the meanings of words, and the speed with which

they accurately respond to reading comprehension questions. Big data analysis technology then comes into play. It synthesizes and analyzes all this data. Suppose it's observed that a particular student spends a relatively long time reading but has a low accuracy rate in answering questions and frequently looks up words. Through the assessment model, it can be deduced that this student might be lacking in vocabulary accumulation and reading skills.

Based on such an objective and precise assessment result, teachers can take targeted actions. In this case, the teacher can create a customized vocabulary - building plan for the student. This plan might involve suggesting specific vocabulary memorization software to help the student expand their word knowledge. Additionally, the teacher can recommend relevant reading - skill training resources, like videos that explain different reading techniques. This way, the assessment process becomes a cycle of gathering data, making informed decisions, and implementing strategies to improve students' learning outcomes.

Second, an online feedback platform can be built. AI delivers immediate, targeted feedback on students' work, assisting them in correcting errors. This prompt feedback also enables educators to adjust their teaching approaches to cater to both individual and group needs, promoting a continuous improvement cycle (Ayeni et al., 2024). Teachers can establish an online feedback platform to provide students with a convenient and fast feedback channel. In China, for example, primary and secondary schools generally use the "Ding Talk" platform to collect and give feedback on homework; most Chinese colleges and universities use the "SuperStarLearn" platform, which can not only provide statistics on attendance, learning status, and completion of homework. It also has an AI assistant teacher who can answer questions and solve problems for students in a timely manner. Through similar

platforms, students can ask teachers or intelligent robots questions and confusions at any time, and quickly get answers and guidance. At the same time, the platform also helps teachers to monitor and effectively manage students' learning in real time, so that they can detect and solve problems in a timely manner.

In summary, artificial intelligence technology can provide important support for the establishment and optimization of English teaching assessment and feedback mechanism, and promote the improvement of teaching quality and the comprehensive development of students' comprehensive quality.

For Students

Customizing contextualized learning paths. AI plays a critical and innovative role in building effective contextualized learning paths. English learning is significantly different from other disciplines in that context occupies a central position throughout English learning, not only in terms of mastering vocabulary and grammar, but also in terms of the ability to utilize the language in specific contexts.

For example, how precisely a student expresses a certain emotion or responds appropriately to a specific question in a specific context is closely related to the student's cultural background, inherent expression habits, and sensitivity to language nuances. Based on this, AI can customize contextualized learning paths for students. For example, with contextualized apps such as “LAIX” and “Talk AI,” students can participate in a variety of scenarios such as mock interviews, daily communication, business meetings or academic lectures, and customize the learning content according to your needs. Through immersive experience, students can gradually familiarize themselves with and adapt to various types of contexts, and then effectively train their ability to cope with different situations.

In addition to the speaking level, AI can customize contextualized learning paths at other levels as well. For example, in English reading, after using ChatGPT to read some literature that the student is interested in, the student can send commands, and it can filter and push suitable reading materials from a large number of English books, news articles, and academic papers according to the student's reading level and interest preferences. For example, if a student is interested in the field of science and technology, then he or she can send a command to ChatGPT: "Please give me some English reading materials related to the field of science and technology and explore them." Then ChatGPT will select relevant cutting-edge English science and technology reports, and at the same time create a context of science and technology discussion with the content of the article, interspersed with explanations of professional terms and background knowledge, to help students understand the article, as if they were in the scene of scientific and technological academic exchanges, and to understand the English expression in the professional context.

Oral ability level. In terms of oral, since there are few native English speakers among Chinese English teachers and there is no relevant English environment in their daily lives, it is difficult for traditional English speaking contacts to meet the demand for speaking practice, and AI can just make up for this shortcoming. Artificial intelligence, through speech recognition and natural language processing technology, can customize contextualized scenarios as mentioned above, but also has a number of important roles. For example, to provide accurate pronunciation evaluation, AI platforms such as ChatGPT and DouBao can analyze students' pronunciation from multiple dimensions such as phonemes, intonation, and alliteration based on its own huge voice database after students complete their oral

expressions, pointing out subtle deviations, such as the fact that many Chinese students tend to mispronounce the "th" sound. For example, many Chinese students tend to mispronounce the sound "th," and it can help students correct their pronunciation by giving them standard pronunciation demonstrations and targeted practice suggestions.

The AI can also realize real-time dialog accompaniment. Take the speaking practice module of Duolingo as an example, students can have real-time conversations with the AI on different topics, and the AI can understand the student's intention and give appropriate responses, no matter whether it's daily chit-chat or professional discussion. During the process, the AI can simulate different accents and speeds of speech, so that students can adapt to a multi-language environment, such as simulating British, American and even Indian English accents, so as to improve students' understanding of different accents and communication skills.

Meanwhile, AI can help students accumulate speaking materials. The AI function of the Youdao Translator APP can automatically capture commonly used colloquial expressions and authentic phrases, such as "kick the bucket", when students are reading English articles or watching movies and TV, and categorize them according to scenarios, so that it is convenient for students to review and memorize them at any time, thus enriching the reserve of colloquial expressions.Students can naturally utilize these materials when communicating and enhance the richness and authenticity of their oral expressions.

Hearing ability level. AI also has a great role in improving students' English listening skills. AI technology can provide students with personalized recommendations for listening materials. As Knox (2020) pointed out, personalized learning can infuse language learning

with excitement and motivation. It allows students to explore their interests while using language skills in real-life-like situations. For example, the "BaiCiZhan Love Reading" APP utilizes AI algorithms to filter and recommend suitable listening content from a massive database of English listening resources based on students' vocabulary levels, listening test scores and personal interests. If students are interested in science fiction and their vocabulary is at an intermediate level, the APP will push English soundtrack clips of movies such as Star Trek and The Descent, excerpts of related science fiction audiobooks, and popular science English radio programs. These materials not only stimulate students' interest in learning, but also ensure an appropriate level of difficulty to help students gradually improve their listening comprehension in an interesting context.

In the process of listening training, AI technology can also realize intelligent speed change and difficulty adjustment. Like the "Daily English Listening" APP, when students are practicing listening, AI can automatically adjust the speed of speech according to the students' understanding of the listening content. When students make a lot of mistakes when listening to a passage for the first time, the AI will automatically reduce the speed of speech so that students can capture each word and sentence more clearly; as students improve their understanding through repeated practice, the AI will gradually increase the speed of speech to the normal or even slightly higher than the normal level, simulating the speed of speech changes in a real scene. At the same time, for complex listening materials, AI will automatically simplify the content, remove rare words or complex sentences, and then restore the original difficulty after the student's listening ability has been improved, helping students to overcome the listening difficulties step by step.

Writing ability level. AI technology also has a huge role to play in improving students' English writing skills; ChatGPT, DeepSeek, and DouBao are among the many AI platforms with powerful algorithms that students can utilize to improve their English writing skills.

First, in terms of model essay generation, when students upload a specific writing topic, these AI platforms are able to quickly generate a standard model essay for students' reference, providing a visual example for students to construct their writing ideas.

Secondly, the AI platform plays an accurate role in correcting grammatical and usage errors in students' daily writing. Taking DeepSeek as an example, when students input an English exercise, the platform is able to keenly recognize wrong grammatical structures in the text, such as subject-verb inconsistency, tense confusion, etc., and give correct examples and detailed explanations.

Furthermore, AI platforms help students enrich their vocabulary and express themselves. They do this by providing synonyms, antonyms, and contextualized vocabulary suggestions. For example, ChatGPT, trained on a vast array of textual data from the internet, is capable of comprehending context, semantics, and the subtleties of language use (Bansla & Bansla, 2012; Budzianowski & Vulić, 2019; Khan, 2021). ChatGPT suggests the use of synonyms such as "gorgeous", "stunning", "picturesque", etc. when students describe "beautiful scenery" if they only use the word "beautiful" to make the expression more vivid and varied. ChatGPT suggests synonyms such as "stunning" and "picturesque" when students describe "beautiful scenery" to make the expression more vivid and diversified, and to help students get rid of the singularity of vocabulary use.

More importantly, the AI system can analyze students' writing styles and linguistic habits in depth and give individualized enhancement suggestions to help students make the most of their own writing styles. Through continuous tracking and analysis of students' writing, the AI platform also has the ability to provide stage-by-stage writing progress reports.

Limitations of Artificial Intelligence in the Process of Personalized Teaching of English at the University Level

The dual constraints of technological ecological construction and teacher literacy

In the Chinese educational landscape, for AI technology to be extensively, systematically, and deeply integrated into college teaching, universities must adopt a macro - level approach to constructing an intelligent teaching ecosystem. On a comprehensive scale of education, it is essential to incorporate technological empowerment into various aspects, including the formulation of training programs, the setting of training objectives, and the development of syllabuses.

Nonetheless, integrating AI into education encounters numerous challenges. Labadlia and Nedjouai (2024) indicated that even highly proficient educators may find it difficult to tailor their teaching to meet the diverse needs of each student when lacking adequate support and resources. In the case of AI-backed teaching, this means that teachers require more than just pedagogical skills. They require proper access to the right tools, proper training, and useful information in order to use AI in the classroom effectively and provide personalized learning to students.

Finances also pose a significant challenge. Sawant and Vaghela (2022) stated that incorporating AI into education demands substantial financial investment for installation,

maintenance, and repair. This financial strain can be a major obstacle, particularly for institutions with limited resources, which may prevent them from accessing new AI technologies.

Moreover, for AI to be effectively used in university teaching, it is essential that university teachers thoroughly learn and master AI-related skills. This calls for enhancing teachers' technological competence and providing them with more digital training. As Fndk, Bayram, and Canaran (2021) as well as Thompson (2018) pointed out, although AI technology has great potential for improving college English teaching, during its practical implementation, it faces issues like high costs, the need for teacher training, and the need for students to adapt. Currently, many college teachers lack knowledge about AI technology, and some even show resistance to it. This not only limits students' proper use of AI technology but also severely impedes the teaching digitalization process. Some teachers merely use AI as a simple classroom - interaction tool and fail to integrate it into teaching research, design, and evaluation. As a result, the integration of AI technology and teaching practice remains at a superficial level, making it hard to fully leverage its technological advantages.

Student dependence on AI technology

There is a significant lack of students' awareness of artificial intelligence technology and their motivation to use it. Some students are overly dependent on this technology, which has a negative impact on their independent innovation ability and learning initiative. College English teaching covers all students in colleges and universities, and students of different grades, regions and majors have different backgrounds and learning habits, and their knowledge of the technology varies. As a second language learning course, students with a weak foundation are prone to fear or slackness in English learning, and although AI

technology provides convenience, it causes some students with poor learning habits to automatically generate and submit texts with the help of AI without thinking when completing the tasks assigned by the teacher, completely losing the ability of independent innovation, which is a serious deviation from the original purpose of teaching.

Data security and ethical risks

Personalized learning (PL) relies on collecting and analyzing large amounts of student data, such as readiness levels, interests, learning styles, and various other distinctive learning characteristics (Graham & Phelps, 2003). This then leads to the fact that the use of AI technology in the process of teaching preparation and learning may have data security issues and privacy protection issues. AI technology is non-interpretable and uncontrollable, and its output results lack reliable security mechanisms. Once it is maliciously utilized, such as information leakage, fraudulent acts or technological attacks, the negative impacts and losses will be difficult to predict, and it will be difficult to implement effective preventive and control measures.

Second, at the level of data ethics, there is no clear boundary to what extent the use of AI tools by students constitutes plagiarism. At the same time, the source of the data provided by many AIs is unclear, and it is very likely that users will steal others' data unconsciously, which poses a greater risk. In addition, given the powerful human-computer interaction characteristics of AI, some of the data or information may contain factual errors, fabricated data, or false information.

Summary

This study focuses on artificial intelligence-enabled personalized teaching of college English, and comprehensively analyzes its current situation, advantages, limitations and application strategies. In terms of the current status of the study, although AI teaching tools and platforms have been widely used to enrich teaching resources and promote innovation in teaching methods, they face challenges in integrating the technology with traditional teaching, teachers and students are skeptical about their acceptance, and the sustainability of long-term application is yet to be explored.

Under the traditional English teaching model, students have difficulties in personalized learning, finding appropriate learning resources, not being able to control the pace of learning on their own, and lacking personalized guidance in understanding the learning content. The core technologies of AI-assisted English learning, such as natural language processing, machine learning and big data analysis, and speech recognition and generation technologies, bring new possibilities to solve these problems. These technologies can achieve personalized learning program customization, real-time language analysis support, standardized voice input and other functions, effectively improving the efficiency and quality of English learning.

In terms of application strategies, teachers can use AI to analyze learners' needs, integrate teaching resources, and improve teaching evaluation and feedback mechanisms; students can use AI to customize contextualized learning paths and improve speaking, listening, and writing skills. However, there are also limitations in the application of AI in personalized teaching of college English, including construction barriers and insufficient

teacher literacy, students' over-reliance on the technology, as well as data security and ethical risks.

Chapter III Conclusions and Recommendations

This study focuses on the core question of “how teachers can effectively use artificial intelligence to personalize college English teaching, overcome the challenges in the traditional teaching mode, and improve teaching effectiveness.” Through a comprehensive analysis of related literature, the study finds that personalized learning in the traditional English teaching mode is fraught with difficulties, including the challenges of learning resource adaptation, the challenges of learning pace autonomy, and the lack of personalized learning support. Artificial intelligence, with its core technologies of natural language processing, cognitive computing, machine learning and big data analysis, speech recognition and speech generation, provides a variety of ways for students to overcome the learning obstacles, such as real-time language analysis, personalized learning path planning, precise teaching interventions, and pronunciation training assistance. Teachers can use AI to analyze students' needs, integrate teaching resources, and optimize the teaching evaluation and feedback mechanism, thus improving teaching effectiveness. However, there are also limitations of AI in personalized English education, such as the double constraints of technology ecological construction and teacher quality, students' over-reliance on it, and data security and ethical risks.

In summary, in order to promote the development of personalized teaching of university English, teachers should improve their own AI application ability, actively participate in systematic training, learn AI theories and the use of related tools in depth, and better integrate them into all aspects of teaching. At the same time, students should be guided to correctly recognize and use AI, avoid excessive dependence, and cultivate students' independent

learning and innovation ability. Colleges and universities and educational technology developers should strengthen the construction of data security and ethical norms, formulate a strict data management and use system, clarify ethical guidelines, and safeguard students' data security. In addition, technology developers need to continuously optimize AI technology to better meet the needs of educational scenarios.

Future research can be carried out in several directions. On the one hand, long-term tracking research is carried out to assess in depth the long-term impact of AI-assisted teaching on students' language synthesis ability, independent learning ability and intercultural communication ability, as well as to explore the key factors affecting the teaching effect. On the other hand, actively explore new modes of deep integration between AI and university English teaching, such as creating immersive learning environments with the help of emerging technologies. In addition, attention is paid to the fairness in the application of AI in education to ensure that different students have equal access to relevant resources and reduce the education gap.

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