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Research on the Reform and Innovation Strategies of College English Teaching from the Perspective of Core Competencies

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Abstract: The rapid development of artificial intelligence technology and the in-depth advancement of the concept of core competencies jointly constitute the dual driving force for the reform of college English teaching. Based on the four dimensions of language competence, thinking quality, cultural awareness, and learning ability of core competencies, this study systematically examines the current realistic difficulties faced by college English teaching and analyzes the empowerment mechanism and practical paths of artificial intelligence technology in English teaching. The research shows that deep learning and natural language processing technologies provide technical guarantees for the precise training of language competence, intelligent learning platforms make it possible to construct personalized learning paths, and multi-modal teaching environments expand the temporal and spatial boundaries and experiential dimensions of language learning. The research proposes innovation strategies oriented by core competencies: realizing the in-depth exploration of curriculum ideological and political elements through the integration and reconstruction of intelligent teaching resources, providing differentiated learning support services relying on the design of a tiered teaching system, constructing a human-machine collaborative teaching model to promote the transformation of teacher roles, and establishing a multi-dimensional dynamic evaluation system to achieve accurate monitoring of the entire learning process. The research aims to promote the organic integration of technology empowerment and competency cultivation, and to provide theoretical reference and practical paths for the high-quality development of college English teaching in the intelligent era.

1. Introduction

In recent years, the rapid development of artificial intelligence (AI) technology is propelling human society into an accelerated era of intelligence. Generative AI, represented by large language models, has emerged successively, profoundly impacting the fields of science and technology, economics, and education. Educational informatization has entered the 2.0 phase, driven by

intelligent information technologies such as AI, big data, and blockchain, leading education to transform and evolve towards the stage of smart education. At the 2024 World Digital Education Conference, the Ministry of Education explicitly proposed the guiding direction of promoting the application of digital education, requiring the education field to proactively embrace technological changes and empower high-quality educational development through digitalization. Against this backdrop, College English, as a public basic course with strong interactivity and broad coverage, is bound to become an important practical field for the digital transformation of education [1,2].

The concept of "core competencies," first proposed by the Ministry of Education in 2014, has become a key lever for deepening curriculum reform and implementing the fundamental task of fostering virtue through education. The core competencies of the English discipline encompass four dimensions: language competence, cultural awareness, thinking quality, and learning ability, reflecting a paradigm shift from "knowledge-based" to "competency-based" and "people-oriented." Language competence emphasizes the ability to use language for understanding and expression in authentic contexts; cultural awareness focuses on understanding Chinese and foreign cultures and recognizing outstanding cultures; thinking quality points to the development of logical thinking, critical thinking, and innovative thinking; and learning ability focuses on students' awareness and strategies for autonomous learning and lifelong learning. The introduction of the core competencies concept provides value guidance and goal orientation for College English teaching reform, prompting teaching to shift from purely instrumental training to the comprehensive development of individuals [3,4].

Currently, College English teaching in universities faces multiple real-world challenges. The efficiency of teaching resource integration is low; the screening and integration of massive digital resources still rely on teachers' personal experience, resource updates lag behind, and they are disconnected from professional needs. The phenomenon of rigid teaching models is obvious; the one-way indoctrination of "teachers lecturing, students listening" is prevalent, ignoring the needs of students with different learning styles such as visual and auditory learners. Teaching assessment feedback is delayed; summative evaluation dominates, while formative evaluation is perfunctory, making it difficult to truly reflect students' language application ability. These problems restrict the generation and development of students' core competencies. The intervention of AI provides new possibilities for solving the above pain points: deep learning models can accurately identify students' pronunciation and conduct oral evaluations, natural language processing technology can automatically correct compositions and provide optimization suggestions at the grammatical and logical levels, and intelligent recommendation algorithms can push personalized learning resources according to students' learning progress. The empowering role of AI technology turns personalized teaching, precise evaluation, and immersive learning from ideals into reality, thereby providing technical support and realistic possibilities for College English teaching reform [5,6].

This study aims to systematically examine the real-world problems of College English teaching reform in universities from the perspective of core competencies, analyze the empowering mechanism of AI, and explore innovative paths for the deep integration of technology and teaching. The theoretical significance of the research lies in promoting the dialogue and integration between the core competencies concept and intelligent education theory, and enriching the theoretical resources for College English teaching reform in the digital era. The practical significance lies in providing college English teachers with operable teaching innovation strategies, providing teaching managers with decision-making references for optimizing resource allocation and improving evaluation mechanisms, and ultimately serving the comprehensive improvement of students' core competencies and the high-quality development of English education.

2. A Realistic Examination of College English Teaching Reform from the Perspective of Core Competencies

2.1 Convergence of Language Ability Cultivation and Application of Intelligent Technology

Language ability is the foundational dimension of core competencies in the English discipline, emphasizing students' ability to use language for comprehension, expression, and communication in authentic contexts. Currently, in college English teaching, language ability cultivation is still mainly based on classroom lectures. Students have limited opportunities to access authentic materials, oral practice often remains at the level of following and imitating, and writing exercises lack targeted guidance. The introduction of intelligent speech recognition technology and natural language processing technology provides new support for language ability cultivation. Intelligent oral training systems can perform phoneme-level recognition and feedback on students' pronunciation, and intelligent writing correction tools can provide multi-dimensional evaluation from the levels of grammar, vocabulary, and logic. The convergence point of technology and language ability cultivation lies in: AI can break through the limitations of traditional classroom time and space, providing students with high-frequency, personalized language practice opportunities, and making language training move from extensive to precise.

2.2 Absence and Reflection on the Development of Thinking Quality in Teaching Practice

Thinking quality encompasses logical thinking, critical thinking, and innovative thinking abilities, and is a higher-order goal of core competencies. Looking back at college English teaching practice, the cultivation of thinking quality has long been marginalized. Classroom questions often remain at low-level cognitive activities such as vocabulary explanation and sentence translation, and students lack in-depth interpretation and critical thinking of the text; the selected texts in teaching materials are mainly narrative and argumentative essays, with a single genre, which is difficult to stimulate students' multi-dimensional thinking; teaching design focuses on the practice of language forms, ignoring the analysis of viewpoints, arguments, and logical relationships[7]. The formation of this situation is closely related to teachers' insufficient understanding of the connotation of thinking quality and the lack of thinking training orientation of teaching resources. Although AI can provide rich language resources and interactive tools, the generation of thinking quality depends on teachers' guidance and design and students' deep participation. Simple technology accumulation is difficult to achieve the goal of higher-order thinking cultivation.

2.3 Traditional Approaches and Limitations in Cultivating Cultural Awareness

Cultural awareness encompasses the understanding of both Chinese and foreign cultures, the recognition of excellent cultures, and the development of intercultural communication skills. In traditional college English teaching, the cultivation of cultural awareness mainly relies on cultural background introductions in textbooks and teacher supplements in class. The content is mostly static cultural knowledge such as holiday customs and literary works, lacking exploration of the dynamic evolution and deep-seated values of culture. When students are exposed to Western culture, they often understand and express it with Chinese thinking, and cultural comparisons remain superficial, making it difficult to form a true intercultural understanding [8]. The core competency concept emphasizes that the cultivation of cultural awareness should shift from knowledge transmission to value recognition and behavior development, guiding students to learn to identify cultural differences and explore the origins of culture. The deep search and multi-modal presentation functions of AI can provide students with rich cultural cases and real communication

scenarios. However, how to avoid cultural flattening caused by technological mediation and how to organically integrate the cultivation of cultural awareness with curriculum-based ideological and political education are still pressing practical problems that need to be solved.

3. AI-Empowered Transformation Mechanism and Practical Paths of College English Teaching

3.1 Support Mechanism of Deep Learning and Natural Language Processing Technology for Language Teaching

Deep learning achieves significant results in speech recognition, natural language processing, and other fields by constructing multi-layer neural network models to realize automatic feature extraction and pattern recognition. In the English teaching scenario, deep learning models can establish accurate speech models by learning massive amounts of standard speech data, and evaluate students' pronunciation from multiple levels such as phonemes, syllables, and intonation, identify incorrect phonemes and provide real-time correction suggestions. This mechanism effectively compensates for the limitations of teachers' limited energy and delayed feedback in traditional classroom oral training, enabling students to carry out high-frequency oral practice even in the absence of a real language environment.

Natural language processing technology is committed to realizing the interaction and understanding between computers and human natural language. In English teaching, this technology supports the core functions of intelligent tutoring systems and essay correction tools. The intelligent tutoring system can analyze the grammar and vocabulary problems raised by students, retrieve relevant information from the knowledge base and provide accurate answers; the essay correction tool performs grammatical analysis, vocabulary evaluation, and logical structure combing on students' texts, points out problems such as subject-verb inconsistency, tense errors, and inappropriate collocation, and provides modification suggestions and usage examples. The intervention of natural language processing technology enables teaching feedback to move from delayed to immediate, and from vague to precise, providing technical guarantee for the refined guidance of language learning.

3.2 Construction Logic of Intelligent Learning Platform and Personalized Learning Path

The intelligent learning platform relies on machine learning algorithms and big data analysis technology to build a student learning portrait system. The platform collects multi-dimensional data such as learning time, course access records, homework completion status, test scores, and learning preferences, and accurately depicts each student's learning characteristics and knowledge mastery through data mining. Based on this portrait, the platform can provide students with personalized learning path design. At the course recommendation level, the platform selects suitable courses from the resource library according to students' professional background, learning goals, and existing level, and dynamically adjusts the recommendation order according to the learning progress; at the learning resource push level, the platform accurately pushes relevant textbooks, courseware, videos, test questions and other resources for students' weak knowledge points.

The construction of personalized learning paths follows the logic of adaptive learning algorithms. When the student's mastery rate of a certain knowledge point reaches the set threshold, the system automatically unlocks more difficult learning content; if the mastery rate is lower than the standard, the basic materials and targeted exercises are re-pushed. This dynamic adjustment mechanism enables the teaching content and difficulty to change in real time with the student's learning status, which not only avoids the waste of efficiency caused by repeated learning, but also prevents the

frustration caused by difficulty jumps. The application of the intelligent learning platform has somewhat alleviated the contradiction between large-scale teaching and personalized needs, and provided technical support for the implementation of the stratified teaching system.

3.3 Creation of Multimodal Teaching Environments and Realization of Immersive Learning Experiences

Multimodal teaching environments emphasize the multiple integration of auditory, visual, and interactive experiences, with AI providing the core driving force for the creation of this environment. In terms of listening and speaking teaching, intelligent speech recognition systems can conduct phoneme-level analysis of students' pronunciation, point out errors after comparison with a standard pronunciation database, and provide correction suggestions. Speech synthesis technology can generate listening materials with different accents and speech speeds according to teaching needs, enriching students' auditory input. In reading and writing teaching, intelligent reading systems supported by natural language processing technology can annotate complex vocabulary and deconstruct long and difficult sentences in texts, linking relevant background knowledge and example sentences. Intelligent writing tools review compositions from the perspectives of vocabulary and logic, providing targeted modification suggestions.

The integration of virtual reality and augmented reality technologies further expands the boundary of language learning scenarios. By wearing VR devices, students can enter virtual English-speaking country classrooms, streets, restaurants, and other scenarios for immersive language practice. When role-playing in virtual scenarios, students' confidence in oral expression and willingness to participate are significantly improved. AR technology transforms static text in textbooks into three-dimensional dynamic images, such as presenting story content in animated form, enhancing the intuitiveness and interest of learning. The construction of a multimodal teaching environment breaks the limitations of time and space in traditional classrooms, enabling students to complete the cycle of language input and output in near-real language contexts, effectively promoting the generation of language application skills.

4. Innovative Strategies for College English Teaching Guided by Core Competencies

4.1 Reconstruction of Intelligent Teaching Resources

The construction of an intelligent teaching resource database is a foundational project for the reform of college English teaching guided by core competencies. Relying on natural language processing and knowledge graph technology, the resource database can perform semantic analysis and classification labeling of massive English texts, incorporating diverse resources such as textbooks, academic papers, news reports, and film and television clips into a structured system. To meet the needs of students in different majors, the resource database should introduce professional corpora such as International Maritime Organization documents, engineering English translations, and business negotiation cases to achieve an organic connection between general English and English for specific purposes. Intelligent recommendation algorithms accurately push matching resources based on students' learning progress, ability level, and interest preferences, enabling students to simultaneously acquire English original excerpts and film and television lines involving the grammar when learning grammar knowledge points, expanding the breadth and depth of language contact.

The exploration of ideological and political elements in the curriculum is the value orientation of resource integration. Teachers use the deep search and text analysis functions of AI to extract ideological and political elements such as national sentiments, social responsibility, cultural

self-confidence, and awareness of the rule of law from teaching content. When teaching Chinese and foreign festival cultures, teachers should guide students to compare and analyze the cultural connotations and modern inheritance of traditional festivals; in units involving science and technology ethics, organize students to discuss whether AI translators can replace foreign language learning and other issues. The resource database should set up a special module for "Ideological and Political Materials," which includes bilingual cases reflecting outstanding Chinese traditional culture, revolutionary culture, and advanced socialist culture, so that value guidance naturally permeates language learning and achieves the organic unity of knowledge imparting and soul shaping.

4.2 Design of a Layered Teaching System and Differentiated Learning Support Services

The construction of a layered teaching system is premised on precise learning analysis. AI data mining technology can collect multi-dimensional data such as students' learning motivation, English proficiency, learning styles, and goal needs to establish detailed learner profiles. Based on clustering algorithms, students are classified into different layers, and differentiated teaching goals and content are designed for students at different levels. In the pre-class stage, the intelligent platform pushes personalized preview materials according to the student's level, or collects learning information through scenario-based dialogue audio to generate a preview effect analysis report. During class, teachers use the platform to initiate layered exercises, and the system records student participation and performance in real time, providing data support for adjusting the teaching pace. In the after-class stage, the system automatically generates personalized learning plans based on classroom performance and homework completion, pushes sentence patterns and detailed model essays for students with writing difficulties, and recommends English speech resources for students with excellent oral skills.

Differentiation of learning support services is an important guarantee for the implementation of a layered system. For open education students with prominent work-study conflicts, the platform should provide fragmented learning resources and mobile learning portals to support anytime, anywhere self-directed learning. For students with weak learning foundations, the intelligent learning assistance system provides 24-hour online Q&A support and knowledge patch pushes; for students with extra learning capacity, the system recommends extended reading materials and research-based learning projects, and guides the transfer of related knowledge points through the knowledge graph function. The combination of a layered teaching system and differentiated support transforms "teaching students in accordance with their aptitude" from an educational ideal into an operational practice.

4.3 Construction of a Human-Machine Collaborative Teaching Model and Transformation of Teacher Roles

The core of the human-machine collaborative teaching model lies in clarifying the respective advantages and collaborative relationships between teachers and AI. AI technology demonstrates high efficiency and accuracy in standardized tasks such as data collection, resource delivery, homework grading, and pronunciation correction, but has obvious limitations in emotional interaction, value guidance, critical thinking training, and cross-cultural understanding cultivation. Teachers should leverage their overall design and process control of teaching activities, positioning AI as an auxiliary tool rather than a replacement. In classroom teaching, teachers use voice commands to call up teaching applications such as sign-in, voting, and quick response, which enlivens the classroom atmosphere while obtaining real-time feedback. In writing instruction, teachers allow students with weak foundations to use AI to assist in generating sentences, guide

students with better foundations to write independently and then use AI to grade, and conduct classroom analysis of the grading results, explaining the advantages and disadvantages generated by the machine.

The transformation of teacher roles is a key aspect of building a human-machine collaborative model. Teachers need to transform from knowledge transmitters to learning guides, technology integrators, and value leaders. The transformation path includes: mastering the operational skills and instructional design capabilities of intelligent teaching tools, and being able to flexibly use AI technology for teaching preparation, implementation, and evaluation in different application scenarios; guiding students to correctly view the human-machine collaboration relationship, and cultivating students' ability to identify the authenticity of AI-generated content; using the time and energy released by AI to focus more on cultivating students' remote learning abilities and emotional support, ensuring that the warmth and humanistic care of education are not dissolved by technological rationality.

5. Conclusion

The introduction of the concept of core competencies and the rise of artificial intelligence technology together constitute the dual drivers of the current college English teaching reform in universities. Core competencies provide value guidance and goal orientation for teaching reform, while artificial intelligence provides technical support and realistic paths for the implementation of competency-oriented teaching. This study shows that the deep integration of the two is promoting the transformation of college English teaching from standardized supply to differentiated services, and from knowledge imparting to ability cultivation. The empowerment of artificial intelligence in college English teaching is reflected in multiple levels: technical support, path construction, and environment creation. Deep learning and natural language processing technologies provide technical guarantees for the accurate training of language skills. Intelligent learning platforms make it possible to build personalized learning paths, and multi-modal teaching environments expand the temporal and spatial boundaries and experiential dimensions of language learning. However, the intervention of technology has not eliminated the core value of teachers. Human-machine collaboration, rather than machine substitution, should become the basic principle of college English teaching reform in the intelligent era. Looking to the future, teaching reform still needs to deepen technical ethics considerations and enhance teachers' digital literacy. Only by adhering to the original intention of education in the integration of technology and education, and seeking balance in the tension between instrumental rationality and value rationality, can we achieve the organic unity of technology empowerment and competency cultivation, and promote college English teaching to a higher quality development stage in the intelligent era.

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