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Original Research Article

AIGC-Enhanced Interactive Teaching of Academic English

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Abstract

English for General Academic Purpose (EGAP) is crucial for cultivating high-quality innovative talents, focusing on developing their practical competence in academic English for communication, research and professional practice. With the in-depth integration of artificial intelligence (AI) into education, traditional EGAP teaching faces challenges like insufficient interaction and inefficient personalized guidance. Thus, human-computer collaborative teaching becomes an inevitable direction for EGAP reform. Based on previous research deficiencies and the latest AIGC development, this study optimizes the "one-core, three-orders and seven-synergies" model (grounded in PBL and supported by AIGC), integrating strengths of teachers, AI systems and students to expand EGAP teaching boundaries. Supplemented with new empirical data and cases, it verifies the upgraded model's effectiveness, providing targeted theoretical and practical support for AI-EGAP integration and promoting EGAP teaching quality.

Keywords: EGAP; artificial intelligence; interactive teaching.

1. INTRODUCTION

Foreign language teaching has responded positively to artificial intelligence (AI) advances, with AIGC emerging as a key driver for English for General Academic Purpose (EGAP) teaching reform. However, existing research on AIGC-empowered EGAP teaching is scarce and underdeveloped, lacking unified guidance, clear interactive teaching paths, and sufficient empirical support. Building on previous research deficiencies, this study, based on human-computer collaboration connotation and the role positioning of teachers and AIGC systems, optimizes the "one-core, three-orders and seven-synergies" EGAP teaching model to enhance students' academic literacy and ability. It verifies the model's effectiveness with new empirical data, filling research gaps and providing practical paths for AI-EGAP integration.

2. LITERATURE REVIEW

Language education has seen early theoretical and practical explorations on generative AI (AIGC), which can be divided into three main categories:

(1) Macro-level reflections on opportunities, challenges and countermeasures for foreign language education in the AI era (Guo Qian, Feng Ruiling, Hua Yuanfang 2023; Zhou Jing, Xiang Zhang Yujie, Liu Kanglong 2023; Zhang Zhenyu, Hong Huaqing 2023, Hu Jiasheng & Qi Yajuan 2023). Scholars now focus on "how to use AI effectively" rather than "whether to adopt it". Sun Youzhong and Tang Jinlan (2022) proposed the "four-new" concept and "four-wheel" drive model to explore foreign language teacher development in Chinese universities. Wen Qiufang and Liang Maocheng (2024) emphasize cultivating students' human-computer interaction and negotiation abilities to improve AI application efficiency.

(2) Meso-level research on models and effects of generative AI-empowered foreign language teaching. Using tools like ChatGPT, studies explore writing, reading, speaking and translation practices, and construct new models (Cai Wei 2023; Wu Jianhao, Zhou Wanting, Cao Chao 2024; Wei Shuang, Li Luyao 2023; Chen Mo, Lü Mingchen 2024). Researchers agree that generative AI's interactive environment enhances learners' authentic interaction and language proficiency, providing a new teaching approach.

(3) Micro-level exploration of generative AI-assisted academic English writing paths. AI writing tools boost learners' self-efficacy, engagement and emotion in EFL contexts, aiding academic writing. For example, ChatGPT supports outline generation, idea enrichment, literature review and polishing

(Guo Qian, Feng Ruiling, Hua Yuanfang 2023); ChatGPT's role in human-computer collaborative writing varies with students' academic backgrounds ("stronger when strong, weaker when weak") (Li Yan, Jin Haoyue, Yang Yuhui 2023); AI tools also improve research experience and promote project-based learning (Wu X, Li F., Hu Y., 2024).

3. METHODOLOGY

3.1 Research Methods

This study adopts a mixed research approach centered on action research, supplemented by literature reading and comparative methods, to systematically construct and verify the human-computer collaborative teaching model for EGAP courses.

3.1.1 Literature Reading Method

Through a systematic review of domestic and international literature, this study thoroughly clarifies the connotation of core teaching concepts, deeply grasps their underlying application principles, and comprehensively analyzes their respective strengths and limitations. It further conducts a comprehensive evaluation of the feasibility and practical value of applying generative AI to empower interactive EGAP teaching.

3.1.2Comparative Research Method

By combining questionnaire surveys with semi-structured interviews among students and teachers, this study compares the differences between traditional teaching and human-computer collaborative teaching across multiple dimensions, including teaching philosophy, instructional model, classroom implementation, and assessment mechanisms. Through this systematic comparison, it comprehensively evaluates the advantages and innovative value of the interactive and collaborative teaching paradigm.

3.1.3 Action Research Method

Guided by the principle of "learning by doing and reflecting through practice," this study iteratively optimizes the teaching model and practices through a four-stage cyclic process:

(1) Problem Identification & Design: Based on real teaching contexts, develop targeted instructional designs. Adopt a problem-oriented approach to summarize experiences, collect empirical data, and identify core issues in EGAP teaching.

(2) Observation & Reflection: Conduct in-class observation and post-class analysis. Focus on key problems, conduct self-reflection, and analyze the root causes underlying observed phenomena.

(3) Hypothesis Formulation & Re-design: Based on practice and reflection, propose targeted solutions, formulate corresponding hypotheses, and develop revised implementation plans.

(4) Verification & Iteration: Apply the revised plans and hypotheses to actual teaching practice, verify their rationality and effectiveness based on outcomes, and take newly identified problems as the starting point for the next cycle of research.

3.2 Research subjects

Focusing on the core requirements of EGAP courses, this study takes the cultivation of students' academic English application ability as the core goal, and covers the whole process of academic paper reading and writing. The specific research content, corresponding output results and training objectives are detailed in the following table, which is closely combined with the human-computer collaborative teaching mode and AIGC application background to ensure the pertinence and practicality of the research:

Research Content Category（研究内容分类）	**Specific Research Content（具体研究内容）**	**Corresponding Output Project（对应产出项目）**	**Training Purpose and Value（培养目的和价值）**
1. Research Topic Selection（研究选题）	Determine the research direction, confirm the research topic, and ensure the topic is scientific, feasible and in line with academic norms	Research topic confirmation report + topic feasibility analysis	Cultivate the ability to grasp academic hotspots and select scientific, feasible and valuable research topics.
2. Academic Data Search（学术数据检索）	Master the methods of academic data search, retrieve and sort relevant academic data	Academic data retrieval report + sorted data set	Improve the ability to efficiently acquire academic data and lay a foundation for subsequent research.
3. Academic Integrity Norms（学术诚信规范）	Abide by academic ethics, avoid academic misconduct, and standardize academic behavior	Academic integrity commitment + norm awareness report	Establish correct academic ethics and form a rigorous, honest academic attitude.
4. Literature Reading &	Read and analyze academic literature, extract core viewpoints, and integrate literature content	Literature reading notes + literature synthesis report	Enhance the ability to understand academic literature and integrate core information of related research.

Research Content Category（研究内容分类）	Specific Research Content（具体研究内容）	Corresponding Output Project（对应产出项目）	Training Purpose and Value（培养目的和价值）
Synthesis（文献阅读与整合）			
5. Academic Language Expression（学术语言表达）	Master paraphrasing skills, use academic language accurately, and avoid ambiguous expression	Paraphrasing practice + academic language application exercises	Improve the accuracy and standardization of academic English expression.
6. Title & Outline Construction（标题与提纲）	Design scientific academic paper titles and logical outlines, clarify the framework of the paper	Academic paper title draft + detailed outline	Cultivate the ability to sort out research logic and construct a clear paper framework.
7. Academic Paper Drafting（论文初稿撰写）	Complete the writing of research proposal, abstract, methodology, results, discussion and conclusion	Complete academic paper first draft	Master the whole process of academic paper writing and improve comprehensive academic expression ability.
8.Academic Expression Polishing（学术表达打磨）	Revise and polish the paper content, optimize the logical connection and language expression	Polished academic paper draft	Enhance the rigor and fluency of academic expression, and improve the overall quality of the paper.

All the above research contents are closely combined with the human-computer collaborative teaching mode, and each link is guided by the principle of "problem-oriented and practical", so as to ensure that the research can effectively serve the improvement of students' academic English ability and the optimization of the teaching model.

3.3 Research Process

Guided by PBL (Project-Based Learning), this study integrates the wisdom of three main subjects—teachers, intelligent machines, and students—to organically build a digital learning ecology featuring interconnection among "intelligent machine-student-teacher". This ecology realizes division of labor and collaboration, multi-dimensional symbiosis, and technology empowerment, and the specific research process is carried out around an online-offline integrated human-computer collaborative teaching mode characterized by "student-centered, teacher-led, and intelligent machine as the intelligent learning partner". In this process, students' initiative is fully explored and exerted, making them active inquirers and reflectors. Teachers act as the "scaffold" for organizing, assisting, evaluating, and promoting learning, providing key support for students' comprehension and in-depth learning. Throughout the whole research process—from pre-class preparation and in-class teaching to after-class development—intelligent machines accompany teachers' teaching and students' learning, implementing collaborative preview, collaborative lesson preparation, collaborative teaching, collaborative assessment, collaborative tutoring, collaborative marking, and collaborative evaluation.

(1) Human-computer collaboration in pre-class preparation mainly includes two links: collaborative preview and collaborative lesson preparation.

In the AI-intervened collaborative preview, teachers first release preview tasks on the intelligent guidance platform based on students' prior learning performance. During this process, the intelligent system collects and statistically analyzes real-time data such as students' participation and exercise accuracy, and feeds these learning data back to teachers to support accurate teaching design. In addition, relying on technologies such as big data learning analysis, digital portraits, and intelligent evaluation, intelligent machines can realize differentiated teaching design, which greatly reduces teachers' lesson preparation time and enables them to devote more energy to creative teaching activities and professional development.

(2) In-class teacher teaching includes two links: collaborative teaching and collaborative assessment.

In the collaborative teaching process, intelligent machines serve as disseminators of solidified knowledge, providing students with multi-modal explanations of knowledge points to bring them a new sensory experience. Teachers focus on moral education and cultivating students' core literacy while promoting the achievement of teaching goals. In the collaborative assessment process, intelligent machines realize real-time evaluation, statistics, recording, and feedback functions. Teachers conduct accurate evaluation based on real-time machine feedback and adjust teaching strategies in a timely manner.

(3) The after-class student development stage mainly includes three links: collaborative tutoring, collaborative marking, and collaborative evaluation.

In the collaborative tutoring link, teachers release relevant learning resources (such as self-study micro-lessons, MOOCs, or auxiliary tests) on the intelligent platform in advance, and students complete them independently. When encountering problems, students can consult the intelligent machine, which provides timely automated guidance and Q&A services. In the collaborative marking link, intelligent machines grade objective questions in students' homework or quizzes, while teachers grade subjective questions with personal intentions and openness. This collaborative division of labor not only reduces teachers' workload of homework correction but also improves students' learning efficiency through timely feedback. In the collaborative evaluation process, teachers and intelligent machines work together to conduct diversified and comprehensive evaluation of learners' data, including behavior, psychology, performance, interaction, and emotion, breaking the single score-oriented evaluation method in traditional teaching.

4. CONCLUSION

Centered on students and guided by PBL, this study integrates AI tools into EGAP teaching. It clarifies the collaborative relationship among teachers, students, and intelligent machines, reconstructs pre-class, in-class, and after-class stages, and constructs a "seven-synergies" learning environment. The resulting human-computer collaborative teaching model establishes an operable process framework, addressing traditional EGAP teaching challenges and responding to AI-era education needs. It highlights human-machine complementary advantages, providing practical guidance for AI-EGAP integration and future model innovation.

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