

Design of Integrating Artificial Intelligence into English Teaching

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Abstract

In order to address the challenge brought by artificial intelligence in traditional English teaching, we analyze the major challenges and problems faced by English teaching in the artificial intelligence environment. Based on practical teaching conditions, we put forward coping strategies from the perspectives of teachers, students, classroom teaching, categorized training, curriculum culture and usage specifications. By adopting these strategies in English teaching, the data reveal that the integration of AI has exerted positive impacts on teacher development, student growth, teaching modes, teaching resources and teaching effectiveness. The study shows that AI instructional design developed based on practical conditions and the integration of AI technologies and tools into teaching activities can exert positive effects.

Keywords: English Teaching, Artificial Intelligence, Challenge, Strategy.

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INTRODUCTION

The development of artificial intelligence (AI) brings great transformation in every field of the world. In the field of education, the achievements and challenges exist in the integration with the AI technologies. The AI integrated into every process of education from teacher to student, from online to offline. The teaching actions change large with advanced technology and types. The innovation formats bring different effect for teachers, students and teaching. AI has dual facets, advantages and disadvantages. We should embrace it actively and apply it rationally so as to achieve the intended benefits brought by the technology.

The application of AI in teaching should be implemented on a discipline-specific basis. For science and engineering disciplines, technologies can be adopted in an in-depth way; while for arts, medicine and agriculture, they should be utilized rationally. Disciplines of science and engineering possess relevant theoretical foundations, so technologies are easier to accept and comprehend when adopted. For other disciplines, their applicability should be taken into

account in the process of understanding, mastering and maintaining such technologies.

AI is evolving rapidly, with diverse integration approaches and technologies. Therefore, tailored teaching designs for different disciplines should be developed in light of the characteristics of AI. English teaching falls within the scope of humanities. When adopting AI, we need to consider not only the changes it brings to teaching forms, but also its integration into teaching content. In addition, teachers' and students' understanding and acceptance of AI should be taken into account [1, 2].

Scholars and experts at home and abroad have conducted extensive research on how to integrate artificial intelligence into English teaching. Existing research covers the application of language models per se, including linguistic accuracy, content development, text organization and vocabulary use. It also investigates the relationships between students' writing performance and various influencing factors, as well as AI technologies and their application scenarios. Furthermore, relevant studies incorporate teachers,

students, teaching materials, personalized instruction, thinking cultivation and the evaluation of teaching effectiveness. A body of research also explores teaching practices empowered by the latest robots and generative AI [1-3].

In our previous research, we proposed a design to embrace the integration of AI into English teaching through approaches including professional training for teachers and students, classroom teaching improvement, categorized assessment, and the incorporation of ideological and political education [4]. Overseas studies center on writing feedback, with multiple perspectives including informal learning, critical use of AI, and Global English. Domestic research focuses on curriculum models and writing instruction, prioritizing the construction of macro frameworks and practical pathways.

Seongyong *et al.*, addresses the issue that GenAI tends to generate Standard English by default in multilingual contexts, failing to reflect the practical needs of non-native speakers and marginalized English varieties. It examines the relationship between ChatGPT-generated English teaching materials and the multilingual reality of Global Englishes (GE), and demonstrates that GE-oriented corpora together with advanced prompt engineering can markedly improve the applicability of model outputs in diverse English-use contexts [5]. Leon Liu *et al.*, focus on English learners' behavioral patterns and user experience, investigating learners' adoption and use of AI platforms in informal digital English learning. It systematically explores how various large language models affect English learning [6]. Li *et al.*, address the fragmentation of existing research on GenAI in SLA and the lack of overall effect-size estimates. It examines the aggregate effects of generative AI chatbots in second language acquisition, proposes a meta-analytic approach to answer the research questions systematically, and provides evidence on effect sizes and moderating variables [7].

English writing stands at the focal point of the integration and research of AI. Qu *et al.*, address the lack of systematic design for LLM-supported writing strategies and the difficulty researchers face in aligning such strategies with pedagogical frameworks. It introduces contradiction analysis into writing integration and develops a design system structured as “principles + strategies” [8]. Zhang *et al.*, investigate how AI feedback influences students' writing performance and emotions in out-of-class contexts. It incorporates out-of-class AI feedback and emotional variables into a unified research framework, expanding the contextual dimension of AI feedback research, and compares students' writing performance and emotional changes under different feedback intervention conditions [9]. Chen *et al.*, explore how teachers can effectively organize writing instructional activities in the ChatGPT-enabled environment. It examines teacher roles and instructional

activity design in college English writing teaching, applies activity theory to the analysis of foreign language instruction within the ChatGPT context, systematically describes how teachers deploy AI tools at each stage throughout the whole writing process, addresses risk mitigation, and provides actionable phased teaching strategies [10]. Zhou addresses the mechanisms and practical pathways of generative AI in English writing instruction. It introduces the theory of ecological affordance into the analysis of AI-empowered English teaching and constructs a framework of mechanisms and pathways based on the logic of “perception–interpretation–action” [11].

In addition, in order to respond to the practical question of how to use AI, Jiao *et al.*, summarizes the pathways for AI-empowered English teaching within a framework of four common business scenarios in English instruction. It translates abstract technological applications into concrete, teacher-operable scenarios and provides a roadmap for frontline English teachers to integrate AI into teaching [12]. To respond to how English education can transform amid the rapid advancement of AI technology, Wen draws on four core elements in English education — teachers, students, teaching materials and artificial intelligence — as well as their interactions. It formally incorporates artificial intelligence into the core components of the curriculum model, proposes a framework of the “new four-element curriculum model”, systematically reconstructs the curriculum structure of English education, and delivers an interpretive curriculum framework for the integration of AI into English education [13].

METHODS

Theoretical analysis is one of the most frequently adopted research methods. It helps lay a theoretical foundation. Built upon existing literature, this approach can yield valuable experiences and lessons [11, 13]. Questionnaires can yield first-hand data. Therefore, questionnaire surveys are frequently adopted for data collection prior to practical research. On this basis, how can AI technologies and tools be deployed in English teaching design to better improve teaching effectiveness? Drawing on existing research findings, this paper proposes several approaches for application in teaching practice.

The first method is thematic or case analysis [9-12]. This approach focuses on a single theme or case. Multiple and complex factors are involved in English teaching. Therefore, researchers may concentrate on one factor to carry out analytical design and practice, so as to tackle key problems or achieve primary benefits. This method is simple, highly replicable, and easy to disseminate.

The second approach is experimental research or research on practical pathways [8-13]. Grounded mainly in data and outcomes, this method begins with

quasi-experiment design. Researchers make continuous adjustments throughout the experiment until its completion. A stable model emerges from the whole experimental procedure, and the dissemination of this model generates practical pathways. This approach focuses on process-oriented inquiry.

The third approach is systematic design and development. Leveraging technological support, this method yields a cyclical and optimizable model. Guided by the design of the system platform, the whole process, outcomes and data can be recorded. AI technologies are further adopted to analyze these data for iterative improvement. With continuous optimization, the platform becomes increasingly sophisticated and accumulates more data over time.

The fourth approach is improvement enabled by specialized AI techniques, such as linear regression, cluster analysis and textual analysis. This method conducts data mining on large-scale datasets and draws conclusions based on the data.

The fifth approach leverages AI tools for the design of generative AI, large language models, intelligent Agents and so on [5-13]. This method relies not only on large-scale datasets but also applies cutting-edge technologies to build intelligent applications.

The sixth approach is the comparative and mixed-methods approach [6]. It draws on the strengths of multiple methods and integrates them to improve effectiveness. Comparisons help identify the advantages and disadvantages of each method, while mixing them enables a balanced trade-off among those strengths and weaknesses, ultimately yielding diverse theoretical and practical frameworks.

RESULTS AND DISCUSSION

Theoretical Outcomes

Through the integration of AI into English instructional design, it is theoretically revealed that the focus of students and teaching has gradually shifted beyond conventional classroom activities. For instance, recent research centers on curriculum models, writing feedback and writing instruction, while embracing diverse perspectives such as informal learning, critical use of AI, Global English, macro framework construction and practical pathways [5].

The theoretical foundation underpins practical research. For example, meta-analysis, quasi-experiments, mixed methods, design-based research, qualitative case studies and other approaches can be adopted in empirical procedures to support the resolution of practical problems [6, 7].

Meanwhile, it enriches relevant theoretical frameworks. For example, studies have incorporated activity theory, sociocultural theory, the technology

acceptance model, critical thinking theory, diffusion of innovations theory, curriculum model theory, and ecological affordance theory.

Practical Outcomes of Instructional Design

Drawing on the theoretical outcomes, diverse technical approaches are constructed in teaching practice to support instructional effectiveness [10-13]. First, teaching platforms are adopted as practical carriers to record the entire practice process. Such platforms store objective data, satisfy the demand for data resources for technical processing, and support analysis and adjustment based on analytical results. They help identify existing problems and track changes throughout the process. Second, practical pathways are developed around cases or themes. Teaching practices designed from established cases or themes are documented on the platform. This enables comparisons of the effects delivered by different cases and enriches materials for thematic analysis. Third, large language models such as ChatGPT serve as the primary technical carrier. They fully support tasks including academic writing in teaching. Multiple AI tools can also be integrated for comparative and mixed-method practice, which improves model efficiency and develops replicable practical models for dissemination. Fourth, cutting-edge technologies such as generative AI and chatbots are deployed for personalized instruction. Leveraging the strengths of these state-of-the-art tools, teachers can tackle practical problems in a targeted manner.

Hot Topics in English Teaching

As AI becomes increasingly integrated into English teaching, the theme of effectiveness deserves priority attention in English instructional activities. First is AI technologies for the improvement of writing skills. A variety of AI tools and large language models such as ChatGPT are adopted to design instructional activities for writing-skill development [1-3]. Relevant strategies can also be extended to AI-enabled practices for other language skills including speaking, listening and reading. Second, the research paradigm is shifting from validation to design. Earlier studies focused on whether AI works, while contemporary research turns to the strategic integration of AI and learners' critical use of AI. Theoretical frameworks and mixed methods are widely adopted in design and research [5, 6]. Third, theoretical frameworks are becoming increasingly diverse. Activity theory, sociocultural theory, the technology acceptance model, critical thinking frameworks, diffusion of innovations theory, and ecological affordance theory have been widely introduced, indicating that research is evolving from technology-driven to theory-driven inquiry. Fourth, the focus has shifted from tool effectiveness to learner development. Instead of centering merely on the capabilities of AI itself, research pays growing attention to human development dimensions such as learners' feedback literacy, critical thinking, the transformation of teacher roles, and academic integrity.

Emphasis on Teaching Design

When designing English instruction integrated with artificial intelligence, several key factors deserve careful consideration. First, clarify the division of labor between humans and AI. AI excels at low-level linguistic feedback concerning grammar, vocabulary, text structure and the like, whereas teachers should focus on higher-order thinking guidance covering content, logic and critical thinking. Second, foster students' feedback literacy, helping them identify, filter and rationally utilize AI feedback and avoid over-reliance on AI tools. Third, adopt the framework of activity theory [10]. Design AI-integrated teaching activities from the perspective of an activity system and attend to contradictions and coordination among its constituent elements. Fourth, attach importance to the connection with informal learning. Following the trend of AI-IDLE, build an integrated in-class and out-of-class English learning ecosystem. Fifth, uphold the bottom line of academic integrity, and guide students to use AI critically as a collaborative partner rather than a ghostwriting tool. Sixth, prioritize the improvement of teachers' AI literacy. Teachers need to master new competencies such as prompt engineering and AI pedagogy to realize the role shift from instructors to facilitators.

Teaching Effect

The deliberate integration and professional design of AI into English teaching greatly improves the overall quality of instructional activities. Supported by AI tools, teachers can delegate tedious tasks such as dictation practice to AI, and carry out professional instructional design centered on learners' needs and teaching effectiveness. This approach transforms teaching modes and enriches teaching content. With AI tools, students can continue tasks unfinished in class after school, freely satisfy their personalized learning needs, and tackle disciplinary problems in their spare time. They are also able to explore different dimensions of English learning according to their own demands and make steady progress in speaking, writing, listening and other skill areas. Within the whole curriculum design, teaching plans, instructional processes and learning outcomes can all be recorded and iteratively optimized. Teaching resources and teaching models are continuously adjusted and refined, creating a combination of universal and customized instruction that traditional teaching alone cannot achieve.

With the support of AI tools, tensions between teachers and students are eased. Cases in which knowledge is translated into practice and competence can be replicated continuously. Students' learning motivation is enhanced, teachers' workload and stress are reduced, and satisfaction among both teachers and students keeps rising.

CONCLUSION

The integration of artificial intelligence into English instructional design is confronted with numerous challenges. Nevertheless, conventional English teaching keeps evolving alongside technological advances and the popularization of relevant tools. AI-enabled design in English teaching brings both gains and emerging issues [2]. First, cutting-edge AI technical approaches such as NLP, machine learning, deep learning, LLMs and knowledge graphs should be considered for integration. Second, typical application scenarios need to be addressed, including automated question-answering and chatbots, machine translation, corpora, intelligent language tutoring, and intelligent language assessment. Third, attention should be paid to core algorithmic models. As specialized technical components, they only require teachers to focus on model selection and application rather than underlying development. Fourth, application effectiveness must be evaluated, covering knowledge acquisition and skill development, core competency cultivation, learning psychology analysis, and the evolution of learning strategies and behaviors. Finally, the benefits and challenges of AI use should be weighed to achieve balanced application and continuous improvement. Naturally, new problems will continue to emerge. For instance, AI-supported language teaching research calls for greater systematization. Researchers need to explore innovative pathways for intelligent language instruction, balance application outcomes and inherent challenges, and examine the strengths, limitations, risks and coping strategies of AI.

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