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Exploring Pedagogical Ideologies and Strategies for College English Writing Instruction from a Generative Artificial Intelligence Perspective

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Abstract: This study, drawing on the commonalities between generative artificial intelligence and foreign language writing instruction, outlines the core ideology of digital humanities-based college English writing instruction, including auxiliary use of generative artificial intelligence tools, primary focus on humanistic education, and the re-production of knowledge, aiming to foster students' critical thinking, collaborative skills, and creativity. Building on this foundation, the study delves into generative artificial intelligence tools applicable to different stages of process-genre writing and their strategic applications. The use of generative artificial intelligence tools is beneficial for students to present, discuss, and share writing content, encouraging them to enhance their writing, collaboration, critical thinking, and creative abilities through deep interaction with model essays and creative discourses.

Keywords: Generative artificial intelligence; College English writing instruction; Process-genre approach; Ideologies and strategies

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1. Introduction

Artificial intelligence (AI), rejuvenated by deep learning advancements [1], has reached new heights with achievements like AlphaGo, MuZero, and AlphaFold. ChatGPT, with so many strong functions, is an integration of multiple technologies such as deep learning, unsupervised learning, instruction fine-tuning, multi-task learning, in-context learning, and reinforcement learning [2]. It exemplifies AI's potential in surpassing human skills in dialogue, writing, translation, and more. This progress is crucial for digital humanities, indicating a fusion of disciplines and innovative methods. AI's ability to understand, create, and innovate human cultural outputs, such as text and music, is transformative. It can imitate styles or authors and analyze vast textual data, uncovering cultural and historical insights, thus aiding in cross-cultural comparative studies.

Teaching English strongly needs any learning model or media that can make the learning process more effective [3]. Now, generative AI's role in foreign language education is gaining academic attention. Researchers explore AI's impact on language learning, teaching, curriculum design, and evaluation. AI teaching assistants

provide personalized learning and timely feedback, enhancing efficiency. In pronunciation training, AI's precise error correction is invaluable for language learners. Additionally, AI tools aid in understanding different cultural contexts, enriching the language learning process. AI also facilitates tailored curriculum design by analyzing learning data.

However, generative AI in language teaching is not without challenges. It struggles with complex human emotions and cultural nuances. In our country, the exploration of digital humanities tools in language education is still emerging.

This study, rooted in generative AI, seeks to understand its intersection with digital humanities and writing instruction. It uses college English writing instruction as a case study to examine the core concepts and strategies of integrating generative AI into teaching methodologies.

2. The philosophical underpinnings of college English writing instruction based on generative artificial intelligence

Generative AI and English writing instruction share significant commonalities, particularly in personalized learning, interactivity, cooperativeness, diversity, and experimentation. Generative AI's personalized approach echoes the student-centered focus in English writing teaching, offering tailored writing suggestions and feedback to enhance skills. Its application in writing instruction also fosters interactivity and cooperativeness, enabling global online interactions among students, teachers, and AI, thus providing diverse perspectives and enriching writing experiences.

Generative AI introduces diversity and experimental aspects to English writing. Language editing and translation skills of ChatGPT can contribute towards increased equity in education by somewhat leveling the playing field for students from non-English speaking backgrounds [4]. It offers a range of writing styles and genres, encouraging creative thinking and allowing students to experiment with different AI tools to explore various writing techniques. This aligns with Lev Vygotsky's sociocultural theory, where learning is a social interaction process. AI supports learning within students' zones of proximal development, providing timely feedback and guidance, and helping them grasp language structures, vocabulary, and expressions. Given its hardware and software requirements, generative AI's use is more viable in higher education. Investigating its integration into college English writing instruction is thus of considerable educational importance.

Generative AI should be viewed as a supplementary tool in humanities education. It enriches traditional teaching methods by providing personalized resources and feedback, aiming to deepen understanding, enhance writing skills, and foster critical thinking. The focus of English writing instruction is to stimulate creative thinking, cultural understanding, and communication skills. AI offers technological support, complementing, not replacing, traditional teaching methods. Teachers play a vital role in guiding students' proper use of AI tools to align with educational goals, thereby enhancing the effectiveness of English writing instruction.

The approach emphasizes knowledge re-production through AI, presenting linguistic knowledge in new, interactive forms, such as modules and visualization tools for grammar and vocabulary. AI facilitates a multifaceted exploration of language, deepening understanding through personalized learning paths.

In group activities, AI tools enable the use of various cognitive skills, particularly higher-order critical thinking. In AI-assisted language projects, students co-create discourses, requiring effective communication and collaboration. This cooperative learning surpasses individual capabilities, promoting team-based thinking and innovation. This method not only improves language skills but also develops teamwork and innovative thinking, preparing students for future academic and professional success.

In summary, generative AI should support college English writing instruction, not as a direct tool but

through AI applications. It deepens writing content understanding, enhances skills, and bolsters critical and innovative thinking.

3. Strategies for college English writing instruction based on generative artificial intelligence

The application of generative AI in humanities research is rapidly evolving, offering new tools and methodologies. The potential of ChatGPT and LLMs (large language models) in education and research is exciting [5]. These include Natural Language Processing (NLP), machine learning models, knowledge graphs and network analysis, predictive modeling, text generation and automated content creation, digital anthropology, data visualization, sound analysis and speech recognition, augmented reality, and virtual reality technologies. The field of foreign language instruction utilizing generative AI is emerging, with current research still in its nascent stages, and the related technological tools of generative AI requiring to be adapted to specific teaching methodologies. This section, building upon a brief review of foreign language writing instruction methods, explores generative AI and its applicable methodologies in the context of process-genre writing instruction.

3.1. Generative artificial intelligence tools in process-genre writing instruction

As an alternative to the product approach, Murray proposed the process-genre approach which focuses on the entire process of writing and fluency of text instead of just the product [6]. This method thoroughly integrates the writing process with the quality of outcomes, emphasizing the exploration of discourse content and genre. The process can be divided into five modules during the instruction: model text deconstruction, collaborative writing, independent writing, peer and teacher evaluation, and work exhibition. This study employs the process-genre approach to explore the practical strategies of implementing generative artificial intelligence tools in college English writing instruction.

In process-genre writing instruction, generative AI tools can be effectively integrated at various stages. During the preparation phase, AI tools like GPT-3 can stimulate creativity and aid in theme exploration by simulating various writing styles and contexts. This helps students broaden their thinking and enrich their content. In the material collection and analysis phase, NLP tools such as the BERT model assist in keyword extraction and topic modeling, enabling efficient organization and understanding of related literature and materials.

For the collaborative writing phase, cloud-based platforms like Google Docs, combined with language generation models, offer real-time writing and editing. These platforms enhance interaction and idea exchange and improve writing efficiency and quality. During the independent writing phase, AI tools like Grammarly help with grammar and style correction, while text similarity analysis tools ensure originality and accuracy by detecting plagiarism.

In the peer evaluation and revision phase, AI grading systems like Turnitin provide preliminary assessments, highlighting areas for improvement in students' writing. Lastly, in the exhibition and reflection phase, data visualization tools such as Tableau display keywords and topics in student work, facilitating joint analysis and reflection on the writing process. This comparative visualization allows students to see their progress and development.

3.2. Application of generative artificial intelligence in college English writing instruction

3.2.1. Model text deconstruction

Writing, integral to language skills and closely related to reading, should start with a deep analysis of

model texts. Traditional writing instruction focuses on dissecting words, sentences, and paragraphs. Recent developments in AI and machine learning have opened the path for the expanding use of chatbots in language learning [7], generative AI tools like ChatGPT offer a new approach to text processing. They analyze and generate texts' macro-structures (themes, styles, narrative structures) and micro-features (grammar, vocabulary, sentence variety). This technology simulates various writing styles and generates creative content, giving students fresh perspectives for exploring writing styles and enhancing discourse understanding and creativity.

At the micro-level, AI tools like ChatGPT excel in analyzing and optimizing vocabulary use. Unlike traditional word cloud tools, ChatGPT provides deeper insights into vocabulary application. It identifies high-frequency words and their usage contexts, suggesting contextually appropriate synonyms and exploring vocabulary variance across genres. This enhances students' language sensitivity and helps them use vocabulary more flexibly and creatively, improving their writing proficiency.

For macro-level discourse genre characteristics, AI like GPT-4 significantly aids in analyzing and generating texts with specific genre elements. GPT-4 can create texts aligned with narrative stages: introducing characters and settings, detailing event progression, creating climactic narratives, and effectively summarizing stories. It assists students in understanding genre structures, adjusting language style, and exploring language use characteristics like vocabulary choice and narrative techniques, enhancing their writing and analysis skills.

Thus, the application of generative AI in both micro- and macro-level discourse analysis and creation not only boosts students' language comprehension and creativity but also offers novel perspectives and tools for language instruction. This approach broadens the scope of traditional writing models, incorporating AI's capabilities in generating diverse, creative content and providing in-depth vocabulary and structural analysis.

3.2.2. Collaborative writing

The application of generative AI, such as ChatGPT, in collaborative writing demonstrates unique advantages. Generative AI can provide real-time and dynamic content creation and language expression suggestions in a group collaboration setting. In narrative writing, it not only helps students build story frameworks but also generates specific plots and character dialogues, guiding students to explore different narrative methods. This process promotes communication and idea exchanges among students, enhancing the efficiency and quality of collaborative writing. In the creation of scientific explanatory texts, generative AI provides detailed background information on specific topics, aiding students in better understanding and expressing complex concepts. Compared to GIS (geographic information system) digital mapping platforms, it places more emphasis on the depth of content and accuracy of language, enabling more effective communication and collaboration during the writing process. Additionally, the application of generative AI is reflected in personalized educational support. It offers customized writing guidance and feedback based on the specific needs of each group or student, helping them identify and improve problem areas in their writing, thereby enhancing their writing and critical thinking skills.

3.2.3. Independent writing

In the context of college English writing instruction, generative AI tools such as ChatGPT, have shown significant potential in assisting students with independent writing tasks and enhancing their writing skills.

Generative AI can offer immediate content generation and structural planning suggestions based on students' writing needs. Whether it is narrative, expository, or argumentative writing, AI can generate rich text content based on a preliminary theme or outline. For instance, in narrative writing, AI can not only provide ideas for story plots but also generate specific character dialogues and scene descriptions, aiding students

in forming coherent and vivid narratives. In terms of language accuracy and authenticity, generative AI has advantages. Compared to traditional corpora, AI can provide more authentic and diverse linguistic expressions as well as offer customized suggestions for specific contexts. For example, when writing argumentative essays, AI can provide reasonable evidence and logical structures based on the argument, helping students construct persuasive reasoning.

Generative AI can provide real-time feedback and suggestions for improvement during the writing process, playing a crucial role in helping students learn the correct use of grammar and vocabulary and enhance their writing style. Students can use AI to compare with corpus usage, identify differences and areas for improvement, thereby deepening their understanding and application of English writing. Additionally, generative AI can assist students in making more appropriate choices in text word selection and phrasing. By integrating with corpus tools, AI can provide usage of vocabulary, collocation patterns, and example sentences in different contexts, helping students improve the accuracy and naturalness of their language.

3.2.4. Teacher-student peer evaluation

In the realm of higher education English writing instruction, the deployment of generative artificial intelligence in teacher-student peer evaluation sessions has revealed its distinct advantages and roles.

Primarily, generative AI can autonomously analyze multiple dimensions of a text, including its structure, grammar, vocabulary, and style, and provide comprehensive feedback. During student peer evaluation sessions, such system support assists students in more accurately identifying and highlighting issues in their peers' compositions, thereby augmenting the quality of evaluations. Furthermore, AI, while pinpointing problems, also offers constructive suggestions and alternative expressions, greatly enhancing students' interactive learning and writing skills.

Secondly, generative AI possesses an edge in handling multimodal discourse. In contrast to traditional evaluative tools, AI is capable of analyzing composite texts comprising text, images, audio, and video. This allows teachers and students to more comprehensively consider different dimensions of the discourse during evaluations, thus improving the comprehensiveness and depth of the assessments. In addition, generative AI supports the customization of evaluation standards and scales. Teachers can establish appropriate criteria and scales based on the characteristics of student works and the AI tools employed, guiding students in conducting thorough analyses and evaluations on various aspects of the texts. This method aids students in enhancing their critical thinking and collaborative skills during their interaction with AI technology and also encourages them to develop new concepts of knowledge presentation.

Lastly, the application of generative AI in teacher-student peer evaluation sessions not only focuses on the writing process rather than merely the final product, but also aids students in achieving a positive feedback loop in their writing learning. Through AI-assisted peer and teacher evaluations, students are able to more deeply understand the content of writing, enhance their language expression and the presentation of the discourse, thus comprehensively improving their writing skills.

3.2.5. Work presentation

In the work presentation phase of college English writing instruction, the use of generative artificial intelligence not only enhances the multi-dimensional presentation of the works but also holds significant importance in improving students' academic writing skills and critical thinking.

Generative AI demonstrates notable strengths in assisting students in creating multimodal discourses. Although traditional digital humanities tools like the story mapping platform StoryMaps support the integrated

use of text, images, audio, and video, generative AI takes a step further by enhancing the intelligence and personalization of creation. For instance, when presenting works on the theme "Telling Chinese Stories in English," generative AI can provide suggestions for textual content and match appropriate visual and auditory elements based on the content, achieving a more dynamic and interactive presentation.

In terms of enhancing the quality of language in the works, generative AI can conduct in-depth linguistic reviews, including accuracy and authenticity checks in grammar, syntax, and vocabulary usage. A research indicates that digital tools can significantly reduce grammatical errors and increase student engagement in language learning. Additionally, generative AI provides personalized improvement suggestions, offering customized feedback based on each student's writing style and habits, thereby enhancing the overall quality of the work.

Regarding interactive evaluation in work presentations, generative AI supports a more comprehensive and objective evaluation mechanism. Compared to traditional collaborative editing platforms, AI can quickly gather and analyze feedback from peers and teachers, providing data-based evaluation results. This not only aids in objectively assessing the quality of the work but also promotes healthy competition and mutual learning among students. Furthermore, generative AI plays a crucial role in promoting students' reflection and self-evaluation. Through AI's analysis and feedback, students can gain deeper insights into their strengths and weaknesses in macro-structure of the discourse, micro-wording, and the use of digital tools. This self-reflection is vital for improving writing proficiency.

Disclosure statement

The author declares no conflict of interest.

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