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Article

Role of Artificial Intelligence in Enhancing University English Writing Instruction

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Abstract: Based on the existing issues in university English writing instruction, we investigate how AI improves specific aspects of university English writing instruction, including real-time feedback and personalized guidance. Additionally, we discuss the potential problems of AI in university English writing education, emphasizing that teachers, while utilizing AI technologies, should conduct in-depth studies on their impact on students' writing skills development, as few studies examine the effects of AI on students' writing development. It also calls for the continuous exploration of ways to integrate AI with teaching practices, with the aim of providing valuable insights for university English education in the age of artificial intelligence.

Keywords: Artificial Intelligence (AI), AI-assisted writing, Challenges of AI integration in writing education

1. Introduction

As the most widely spoken language in the world, English serves as a global lingua franca, facilitating communication in various fields such as business and international relations. However, learners frequently encounter significant obstacles in mastering English, particularly in academic writing. Common barriers include limited language exposure, insufficient practical application opportunities, and untimely or inadequate feedback from instructors. As a result, many students struggle to develop critical writing skills such as logical argumentation, coherence, and creative expression. Despite the importance of addressing these issues, traditional instructional methods frequently fail to provide adequate support.

We explore how artificial intelligence (AI) can bridge these gaps by providing personalized feedback and fostering independent learning. Specifically, it examines the potential role of AI in enhancing university-level English writing instruction and identifies challenges and opportunities for integrating AI with existing teaching practices. Recently, AI has had a profound impact on various industries, spanning areas such as smart devices, manufacturing, transportation, healthcare, and more, influencing daily life. AI is a broad field that encompasses the integration of multiple disciplines, including computer science, cybernetics, information theory, neurophysiology, psychology, philosophy, and linguistics (Bin & Mandal, 2019; Crompton & Burke, 2023; Pokrivčáková, 2019). In the field of education, particularly in English language teaching, AI's influence is also steadily increasing. AI is increasingly recognized as a tool that can support English language teaching and learning by providing new strategies to overcome challenges and enhance learning opportunities (Baranwal, 2022). Due to the demand for English as a global language, the need for English proficiency has become increasingly important, especially in countries where English is a second language. Thus, it is particularly essential to cultivate and train learners to learn English in an AI-driven environment.

We seek to examine the role of AI in enhancing both teaching and learning outcomes in university English writing. It delves into the ways AI can support teachers and students in improving writing skills, while also identifying the potential challenges that may arise in integrating AI into English language education. Additionally, we emphasize the importance of teachers conducting thorough investigations into the effects of AI on students' writing development. It advocates ongoing efforts to find effective methods for integrating AI with traditional teaching approaches to advance university English education in the era of AI.

2. Literature Review

A series of studies have provided valuable insights and empirical findings on how AI can assist in English language learning. These studies not only highlight the potential of AI technologies in education but also demonstrate their practical applications in enhancing learning efficiency and personalizing teaching methods.

Research underscores the transformative potential of AI in the realm of English Language Teaching (ELT). Li (2017) developed an AI-driven intelligent English teaching model utilizing Java software and Prolog language systems. Through qualitative

research methods, including an online learning system browser and Dreamweaver web development tools, the study mined and collected student data. The findings revealed that the model could calculate knowledge areas that students needed to acquire or strengthen based on their prior knowledge. However, the study noted that further improvements to the interface were necessary. AI-powered speech recognition technologies have expanded the application of ELT, particularly in speaking training (Kannan & Munday, 2018). Bin and Mandal (2019) focused on exploring AI-based English language teaching practices. They developed an English language teaching software called SAIET, which uses data mining techniques to analyze large amounts of data from the web to identify user preferences and patterns. Their study employed a mixed-methods approach, combining literature analysis and field surveys. The results indicated that the system provided valuable support for teachers by offering data on student learning and creating a personalized learning environment for students, which in turn improved learning outcomes. Machine translation has accelerated the development of English language teaching and is considered a valuable supplementary tool in ELT (English Language Teaching) (Fedosov et al., 2019). Junaidi et al. (2020) explored the impact of the Lyra Virtual Assistant (LVA) on EFL speaking skills, arguing that Lyra was an effective tool in improving speaking proficiency. Chong (2021) proposed an AI-integrated writing model for ELT, which successfully boosted students' writing abilities and increased their interest in writing. Sun et al. (2021) proposed an online intelligent English teaching system based on deep learning, aimed at helping learners improve their English efficiency based on their knowledge levels and individual needs. The system used decision tree and neural network algorithms and employed qualitative research methods to analyze the use of learning services and predict student performance. The results indicated that the system outperformed others in assessing the quality of interaction, level of engagement, and learning activities. Sun et al. (2021) introduced a deep learning-based intelligent English teaching system designed to increase the efficiency of English teaching, demonstrating that the system significantly improved student performance, surpassing traditional teaching methods.

The role of AI in enhancing writing skills and educational outcomes is also well-documented. Kim (2019) focused on using AI chatbots to improve English grammar skills. By having participants interact with a chatbot named Replika, the study found that Replika significantly enhanced participants' English grammar skills. However, the research also highlighted gaps in this area of study. Rebman (2006) emphasized two core functionalities of speech recognition: speech-to-text and text-to-speech.

Collectively, these studies demonstrate that AI plays a multifaceted role in assisting English language learning, ranging from creating personalized learning environments to improving learning efficiency and reducing learning anxiety. While the application of AI in education is still in its developmental stages, these findings provide a solid foundation for future research and applications of AI in education. With ongoing technological advancements and deeper research, we can expect AI to play an increasingly important role in the field of English language learning, offering richer and more effective teaching and learning tools for both teachers and students.

3. Current State of University English Writing Instruction

University English writing serves as a crucial platform for enhancing students' language skills, critical thinking, and communication abilities. However, as highlighted by Al-Faki (2015), Taye and Mengesha (2024), and Bulqiyah et al. (2021), students encounter various challenges throughout the writing process.

Many students lack a sufficient vocabulary and grasp of grammar, which leads to unclear expression, simplistic sentence structures, and a lack of logical flow and coherence in their writing. Students frequently receive inadequate writing instruction, particularly in areas such as essay structuring, argument development, proper citation, and avoiding logical fallacies. Most university English writing courses are predominantly teacher-centered, offering limited opportunities for students to practice writing or engage interactively. Students often act as passive recipients of knowledge, receiving minimal personalized feedback. Due to large class sizes, teachers might struggle to provide detailed, individualized feedback on each student's writing. As a result, many writing errors go unnoticed, and it becomes difficult to improve the overall quality of student writing. Traditional assessment methods typically rely on final exams or standardized grading, neglecting to focus on the writing process and failing to encourage students to reflect on and revise their work.

As globalization advances, writing has become not only a reflection of language proficiency but also a tool for intercultural communication. However, many university English writing courses fail to equip students with the necessary skills for writing effectively across different cultural contexts. Exploring AI's impact on intercultural writing competencies within diverse educational contexts warrants further research. Although there are many writing platforms and tools (such as grammar checkers, and writing feedback systems) available, their usage in university English writing instruction remains limited. Both teachers and students are not fully aware of or making the most of these technologies. Many educators continue to rely on traditional writing methods, whereas students often underutilize online resources to improve their writing skills. Traditional writing instruction often relies on teachers manually grading assignments, resulting in feedback cycles and inefficiency. As a result, many students miss the opportunity to make timely improvements, and the feedback they receive may not be sufficiently targeted to help them make significant strides in

their writing. In university English writing courses, opportunities for extracurricular writing practice are few. Most students do not have enough chances for independent practice or to engage in peer writing exchanges, leading to a lack of confidence and proficiency in real-world writing scenarios. There is also a lack of comprehensive support for the writing process in class, such as peer reviews or group discussions, which limits students' growth as writers.

The challenges currently facing university English writing instruction primarily include students' overall low writing proficiency, traditional and one-dimensional teaching methods, a lack of confidence and creative thinking among students, and limited use of information technology in writing instruction. To address these issues, it is crucial to reform teaching methods, provide more opportunities for writing practice, utilize modern technological tools to enhance writing efficiency, and prioritize timely, personalized feedback. Additionally, fostering critical thinking and creativity, while helping students build confidence in their writing, is essential for improving their writing skills.

4. Applications of AI in University English Writing Instruction

Building on the previous discussion, this section delves into the diverse applications of AI in enhancing university-level English writing. We explore how AI can assist students in refining their writing skills and boosting their academic performance, drawing on insights from Bin and Mandal (2019), Li (2017), and Chong (2021).

4.1. Real-Time Writing Feedback and Guidance

AI analyzes students' writing in real-time, identifying common issues such as grammatical errors, spelling mistakes, and logical inconsistencies. It provides precise feedback, analyzing the logical structure of the text and helping students improve their argumentation and paragraph organization, thereby enhancing the coherence and persuasiveness of their writing.

4.2. Personalized Writing Suggestions

Since each student's writing level and learning needs are different, AI can offer personalized writing suggestions based on the student's writing style and types of errors. For example, for students struggling with grammar, AI can focus on helping them master common issues such as tense and voice. For students with weaker logical reasoning skills, AI can analyze the structure of their writing, helping them organize paragraphs and arguments more clearly. Moreover, AI customizes writing tasks and exercises to students' interests and learning progress, supporting gradual improvement.

4.3. Creativity and Content Generation

When students face a lack of inspiration or are limited in their writing ideas, AI can help stimulate creativity. For instance, it can provide topics or keywords to help students expand their thoughts, generate related paragraphs or sentences, and encourage deeper thinking in their writing. AI can also offer suggestions for improvement, helping students enhance the depth and innovation of their content, making their writing more persuasive and engaging.

4.4. Development and Enhancement of Writing Skills

AI not only helps students revise and refine individual pieces of writing, but also contributes to their writing development by accumulating their writing history. Specifically, AI can provide training on writing techniques, teaching students how to construct arguments, improve logical flow, and use more advanced vocabulary and sentence structures. It can also provide templates and structural guidance for different types of writing, such as academic essays and argumentative papers, helping students understand the requirements and techniques for various writing formats.

4.5. Critical Thinking and Writing Reflection

AI can support the development of students' critical thinking and self-reflection skills. During the writing process, AI can analyze the effectiveness of the arguments students present, guiding them on how to engage in deeper thinking and independent logical reasoning. Additionally, AI can help students reflect on their own writing, offering detailed analytical suggestions that highlight areas for improvement and suggesting deeper angles of thought. For example, AI can rapidly retrieve vast amounts of information, providing students with access to diverse perspectives and background knowledge on a given topic. This variety of

sources can encourage students to approach problems from different angles, thereby strengthening their critical thinking. By moving beyond a single textbook or source, students can explore a wide range of viewpoints, allowing for a more comprehensive analysis and evaluation of issues. AI can also help students identify potential biases or gaps in their writing through feedback mechanisms. By analyzing their work, AI can highlight assumptions and inconsistencies, prompting students to reconsider their premises and leading to a more objective, nuanced understanding of the issue at hand.

4.6. Self-Improvement and Autonomous Learning

AI provides continuous learning support for students, helping them progress independently in their writing. By interacting with AI, students can participate in self-directed writing activities and obtain immediate feedback, which enhances their capacity for autonomous writing and independent learning. AI tracks students' learning progress, analyzes common writing issues, and suggests personalized learning plans to help them steadily enhance their writing abilities.

AI helps university students gradually improve their language skills, critical thinking, and writing techniques through instant feedback, personalized guidance, and creative stimulation. Meanwhile, teachers can use AI's automated assessment and feedback systems to optimize their teaching plans, making writing instruction more efficient and tailored to individual needs. It is recommended that students and educators utilize several AI or AI platforms to enhance university English writing, such as Grammarly, ProWritingAid, Hemingway Editor, QuillBot, and others.

5. Potential Challenges of AI in University English Writing Education

Along the lines of Taye and Mengesha (2024) and Crompton et al. (2024), the integration of AI into university English writing instruction poses certain challenges. Despite AI's potential to enhance writing education, challenges remain in its adoption and application. Many educators and students lack a comprehensive understanding of AI and their potential benefits for writing instruction. This can lead to resistance or reluctance to incorporate AI into the learning process. Moreover, although AI can offer feedback on grammar, style, and coherence, it may not fully capture the nuances of writing, such as argument development, critical thinking, or originality. Teachers' feedback remains indispensable for fostering semantic analysis and critical thinking; without it, feedback may become superficial and fail to address deeper issues in writing. Students may develop an overreliance on AI for tasks such as grammar checking and content generation, which could impair their ability to cultivate critical writing skills independently. This reliance might reduce their engagement in the writing process and creativity.

Furthermore, the use of AI frequently entails uploading students' written work online, raising concerns about the privacy and security of personal data. Institutions must ensure that AI platforms comply with privacy regulations and safeguard sensitive information. AI is still relatively new in education, and integrating it effectively with traditional teaching methods can be challenging. Teachers may struggle to balance the use of AI with conventional teaching approaches, especially in large or resource-limited classrooms. Note that the use of AI in education, particularly in writing, raises ethical questions about authorship and originality. Students may misuse AI to generate content without understanding the ethical implications, leading to issues related to plagiarism and academic integrity.

Addressing these challenges requires a multifaceted approach. First, professional development workshops for educators and student orientation sessions can mitigate resistance to AI integration. Pilot programs should also be launched to provide hands-on experience with AI in language teaching. To ensure meaningful feedback, a hybrid model combining AI and human input can offer more thorough evaluations. Investing in advanced AI and incorporating peer reviews can enhance critical thinking. To avoid overreliance on AI, its use should be balanced, focusing on skill development and limiting its role in certain assignments. For privacy, strong data protection policies and transparent usage guidelines must be in place. A blended learning approach can help integrate AI with traditional methods, supported by adequate resources. Finally, to address concerns about authorship and originality, education on academic integrity, plagiarism detection, and clear guidelines for AI use should be implemented. These strategies will help ensure a successful and ethical integration of AI in university writing education.

Furthermore, to mitigate the challenges of AI integration, it is essential for both instructors and students to receive training on the effective and ethical use of AI. AI-generated feedback should complement, rather than replace, human instruction to prevent undermining the development of critical skills such as creativity and independent thinking. A blended approach, combining the strengths of AI with teacher guidance, ensures that AI remains a supplementary tool, enhancing rather than replacing traditional pedagogical methods. This approach allows instructors to provide personalized support, helping students develop well-rounded writing skills essential for their academic and professional success.

6. Conclusions

Incorporating AI into university English writing instruction holds the immense potential to transform both the learning experience and student writing outcomes. AI-powered tools deliver real-time, personalized feedback that allows students to quickly identify errors and refine their writing. These technologies effectively address common writing challenges, including grammatical errors, syntactic errors, and problems with coherence. Beyond error correction, AI promotes independent learning and critical self-reflection, encouraging students to take an active role in improving their writing skills.

However, it is crucial to recognize the limitations of AI, particularly in areas such as language quality, accuracy, and data privacy concerns. Although AI provides substantial support, overreliance on technology could undermine the development of essential writing skills, such as critical thinking and creative expression. To address this issue, a balanced approach is required—one that combines the strengths of AI with the expertise and guidance of educators. AI should serve as a complementary tool to enhance teaching rather than as a replacement for traditional pedagogical methods. By adopting a blended learning model, instructors can provide more personalized support, helping students to cultivate comprehensive writing abilities that are vital for both academic and professional success, especially in an increasingly technology-driven world.

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