

Research on AI in the School-Based Curriculum of University Education: A Case Study of English Writing Instruction in *Zhanjiang Marine Culture*

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Abstract: This paper explores the integration of artificial intelligence (AI) technology into English writing instruction, focusing on a case study of the Zhanjiang Marine Culture course at Zhanjiang Preschool Education College. The study addresses common challenges in traditional English writing teaching, such as limited resources and lack of personalized instruction, and demonstrates how AI can provide substantial benefits. AI technology enhances teaching by generating diverse multimodal resources and model essays, offering personalized feedback, and supporting creative and critical thinking. The case study reveals that AI significantly enriches teaching materials, supports individualized learning, and improves students' writing skills and cross-cultural communication abilities. By leveraging AI, the course provides a richer learning experience, fosters higher-order thinking, and introduces innovative teaching methods. This study highlights the potential of AI to transform English writing instruction and offers new approaches for enhancing educational practices.

Keywords: AI, English writing instruction, personalized learning, multimodal resources, cross-cultural communication

1. Introduction

In the current English writing teaching, we face several pressing issues and challenges. First, the limitation of teaching resources is a common problem^[5]. Due to various reasons, such as the slow update of textbooks and the limited knowledge reserve of individual teachers, the writing materials that students are exposed to are often monotonous and lack novelty. This restricts the development of students' thinking and creativity, causing their works to lack individuality and innovation. Second, the lack of personalized teaching is another urgent issue^[2]. In traditional writing teaching, teachers often adopt a "one-size-fits-all" approach, neglecting the individual differences and diverse needs of students. As a result, some students struggle to keep up with the pace and difficulty of the teaching, feeling overwhelmed or losing interest in learning, while others may find the content too simple or dull.

2. The Integration of Artificial Intelligence and English Writing Teaching

The introduction of artificial intelligence (AI) technology has brought revolutionary changes to English writing instruction. AI can not only quickly generate a large amount of writing materials and model essays based on teaching needs, providing students with abundant learning resources, but also analyze students' written works through algorithms, offering personalized feedback and guidance^[4]. This technology can stimulate students' interest in learning and creativity while enhancing their writing skills and cognitive abilities. *Zhanjiang Marine Culture* is an elective course offered by Zhanjiang Preschool Education College. The course introduces thousands of years of Zhanjiang's maritime culture, covering listening, speaking, reading, and writing modules, and is taught bilingually in Chinese and English. It is open to students from all majors. In the English writing instruction of *Zhanjiang Marine Culture*, we can utilize AI technology to generate multimodal corpora related to maritime culture. These corpora may include texts such as articles, stories, and dialogues on topics like marine ecology, maritime history, ocean economy, and marine technology, as well as related multimedia resources like images and videos. These multimodal resources can provide students with a vivid and engaging learning experience, sparking their creative inspiration and imagination. At the same time, AI technology can provide us with authentic English model essays. These essays may be high-quality texts

generated from vast linguistic data or classic works selected and adapted by teachers. By studying and imitating these model essays, students can better grasp the norms and requirements of English writing, improving the accuracy and fluency of their language expression. Furthermore, AI technology can offer personalized feedback and guidance for students' writing. By analyzing students' written works, AI can identify errors and shortcomings in areas such as grammar, spelling, and semantics, and provide specific suggestions for improvement. This personalized feedback not only helps students better understand where their problems lie but also guides them in finding ways to solve them. At the same time, teachers can adjust their teaching strategies and methods based on the feedback and performance of students, offering more precise and effective guidance.

3. The Application of AI in the Course of *Zhanjiang Marine Culture*

3.1 Background and Overview

In the bilingual course of *Zhanjiang Marine Culture*, our goal is to engage students in a series of teaching activities that allow them to gain a deep understanding of the maritime culture of the Zhanjiang region and express their insights and feelings through English writing. With the rapid development of AI technology, we have integrated it into writing instruction. By designing specific teaching cases, we demonstrate its advantages in enhancing students' English writing skills and cross-cultural communication abilities. This case will focus on the "Marine Resource Conservation" unit within the course of *Zhanjiang Marine Culture*. Supported by AI technology, we will design a series of writing tasks that align with students' interests and the course requirements. Through this case, we will explore how AI technology can be utilized to achieve efficient and personalized teaching, while simultaneously promoting the improvement of students' English writing abilities.

3.2 Teaching Objectives and Requirements

The core objective of this lesson is to help students understand the rich connotations of Zhanjiang's maritime culture, particularly the importance of marine resource conservation, and express their opinions and feelings through English writing. Specifically, the teaching objectives include the following:

- **Knowledge and Skills:** Students will be able to grasp basic English writing skills, including grammar, vocabulary, sentence structure, and essay organization. They will also learn about marine resource conservation and develop an understanding of its significance.
- **Process and Methods:** Students will be able to independently engage in writing activities using AI-provided tools and resources. Through group discussions and peer evaluations, they will enhance their critical thinking and independent thought.
- **Emotional Attitudes and Values:** Students will become aware of marine resource conservation issues and develop environmental awareness. Through writing, they will express their love and respect for maritime culture.

To achieve these teaching objectives, we need to design writing tasks that align with students' interests and course requirements while leveraging the advantages of AI technology to provide personalized learning support.

3.3 Teaching Process

3.3.1 Generation of Multimodal Corpora and Model Essays

In the initial stage of teaching practice, teachers will use AI technology, such as ChatGPT 3.5, to generate multimodal corpora and model essays related to maritime culture. These materials will serve as foundational resources for guiding students in gaining a deeper understanding of various aspects of maritime culture.

First, teachers can utilize the text generation features of ChatGPT 3.5 to produce a series of text corpora closely related to the theme of marine resource conservation. These corpora can include articles, stories, news reports, and more, covering topics such as the current state of marine resource conservation, related challenges, and potential solutions. Through these materials, students will gain a comprehensive understanding of the importance and urgency of marine resource conservation, laying a

solid foundation for subsequent writing activities.

Next, teachers can leverage ChatGPT 3.5's image and video generation capabilities to create multimodal corpora related to the characteristics of maritime culture. These materials may include images and videos depicting marine ecosystems, seascapes, marine life, as well as short videos showcasing marine conservation efforts. These multimodal resources will provide students with a vivid and immersive visual experience, helping them better understand and appreciate the charm of maritime culture.

In terms of generating model essays, teachers can use ChatGPT 3.5's model essay generation feature to create writing samples that meet the teaching objectives and requirements. These samples can include different types of essays, such as expository, argumentative, and narrative, as well as essays in different styles, such as formal, informal, academic, and creative. By showcasing and analyzing these model essays, students can learn various writing techniques, methods, and language expressions from different cultural backgrounds.

3.3.2 Guidance in Analyzing and Understanding the Corpora and Model Essays

After generating the multimodal corpora and model essays, teachers need to guide students in thoroughly analyzing and understanding these materials. This process will help students gain a deeper insight into the essence and characteristics of maritime culture, providing strong support for their subsequent writing activities.

First, teachers can organize students to read and discuss the textual corpora. By reading and analyzing these texts, students can learn about the current state of marine resource conservation, its problems, and challenges, developing an understanding of the importance of protecting marine resources. Additionally, teachers can guide students to focus on the language expressions and writing techniques used in the texts, helping them learn how to utilize rich vocabulary and sentence structures to express their views and feelings.

Next, teachers can use the multimodal corpora to enhance teaching. By showcasing images, videos, and other visual materials, teachers can help students gain a more intuitive understanding of topics such as marine ecosystems, seascapes, and marine life. These visual materials will provide students with vivid and concrete sensory experiences, allowing them to better comprehend and appreciate the charm of maritime culture.

In the process of analyzing the model essays, teachers should guide students to pay attention to the writing techniques and styles used in these essays. By analyzing aspects such as the structure of the essays, paragraph organization, and sentence usage, students can learn various methods of writing for different genres. Moreover, teachers can encourage students to focus on the cultural elements and linguistic features within the model essays, teaching them how to express themselves and communicate effectively in different cultural contexts.

3.3.3 Conduct of Writing Activities

After analyzing and understanding the multimodal corpora and model essays, teachers need to organize students to carry out writing activities. During this process, students will apply the knowledge and skills they have learned, combining their own thoughts and creativity to complete writing tasks.

Before starting the writing activities, teachers can design tasks that align with the students' interests and the course requirements based on the teaching objectives. These tasks may include extended writing based on textual corpora or situational writing based on multimodal corpora. Through these tasks, students will gain a deeper understanding of maritime culture and express it, while also honing their English writing skills.

During the writing process, teachers need to provide timely guidance and support. They can utilize AI technology's personalized feedback features to analyze and evaluate students' work in real-time, offering specific feedback and suggestions^[5]. This feedback will help students refine their work, improve the quality of their writing, and enhance language accuracy.

Additionally, teachers can organize activities such as group collaboration and peer review. Through group discussions and peer evaluations, students can learn from one another, improving their critical thinking and independent problem-solving skills. These activities will help students master English writing techniques and methods while enhancing their cross-cultural communication abilities.

3.3.4 Guidance through Personalized Feedback

After the writing activities are completed, teachers need to use AI technology's personalized feedback features to conduct an in-depth analysis and evaluation of students' work. Through this process, teachers can provide specific feedback and suggestions, helping students refine their work and improve their writing skills and language accuracy.

First, teachers can utilize AI technologies such as ChatGPT 3.5 to automatically grade and provide feedback on students' work. This grading and feedback will evaluate aspects such as content and language expression, helping students understand their strengths and weaknesses. Second, teachers can combine the AI-generated feedback with their own assessments. During the evaluation, teachers should focus on students' creativity, thought processes, and expression abilities, offering specific suggestions and guidance. This will help students better understand their work and find ways to improve. Finally, based on students' individual needs and circumstances, teachers can provide customized writing training. By designing advanced writing exercises tailored to students' levels, teachers can help them target specific areas for improvement in writing skills and language accuracy. Moreover, teachers can provide more writing opportunities and platforms aligned with students' interests and hobbies, sparking their creative inspiration and passion.

Through this teaching practice process, teachers will be able to fully leverage the advantages of AI technology to offer personalized learning support, fostering the development of students' English writing skills and cross-cultural communication abilities.

3.4 Assessment of Teaching Effectiveness

3.4.1 Evaluation Criteria and Methods

After the teaching practice is completed, assessing its effectiveness is an essential step. Through scientific evaluation methods, teachers can accurately understand the improvements in students' English writing skills and cross-cultural communication abilities with the support of AI technology, thereby providing an objective evaluation of the teaching practice's effectiveness.

First, determining evaluation criteria is the foundation of the assessment. For English writing instruction, evaluation criteria may include grammar accuracy, content completeness, logical coherence, and creativity in students' work. Additionally, considering the development of cross-cultural communication skills, the evaluation should also include criteria such as students' ability to understand different cultural backgrounds, awareness of cultural differences, and cross-cultural communication skills. In terms of evaluation methods, a combination of quantitative and qualitative assessments can be used. Quantitative evaluation primarily involves automated scoring of students' work, analysis of vocabulary richness, and sentence complexity to reflect improvements in their writing skills through objective data. Qualitative evaluation involves teachers' manual assessments, students' self-assessments, and peer evaluations. These methods provide deeper insights into students' writing processes, cognitive development, and their understanding and experience of cross-cultural communication.

3.4.2 Comparative Analysis Before and After Teaching

To more intuitively demonstrate the role and impact of AI technology in English writing instruction, teachers can conduct a comparative analysis of students' writing abilities and cross-cultural communication skills before and after the teaching practice.

First, collect samples of students' work before the teaching practice to conduct an initial assessment of their writing abilities and cross-cultural communication skills. This can be done by analyzing aspects such as grammar, content, and logic in the work, as well as through surveys or interviews to understand students' cultural awareness and cross-cultural communication abilities.

Then, after the teaching practice is completed, collect another set of students' work samples for reassessment of their writing abilities and cross-cultural communication skills. By comparing the work samples from before and after the teaching practice, teachers can identify improvements in areas such as grammar accuracy, content completeness, and logical coherence, as well as in students' understanding of cultural differences and their cross-cultural communication skills. Additionally, teachers can further evaluate the impact of AI technology in English writing instruction by comparing changes in students' classroom performance, participation, and learning interest before and after the teaching practice.

3.4.3 Collection and Analysis of Student Feedback

Student feedback is a crucial reference for evaluating the effectiveness of teaching practices. After the teaching practice is completed, teachers can gather students' feedback through surveys, interviews, and other methods to understand their perceptions and evaluations of the teaching practice.

When collecting student feedback, teachers should design questions that are targeted and thought-provoking, guiding students to reflect deeply on how the teaching practice has impacted their writing skills and cross-cultural communication abilities. Teachers should also encourage students to provide their opinions and suggestions to improve and refine the teaching practice.

In analyzing student feedback, teachers should focus on the following aspects:

- **Overall Evaluation of the Teaching Practice:** This includes students' satisfaction with the teaching practice, their level of interest, and their perceptions of the impact on their writing skills and cross-cultural communication abilities.
- **Perceptions and Experiences with AI Technology:** This includes students' acceptance of the technology, frequency of use, and any issues or suggestions they encountered during its use.
- **Suggestions for Improvement:** This involves students' feedback on aspects such as teaching content, methods, and assessment approaches.

By analyzing student feedback, teachers can identify the strengths and weaknesses of the teaching practice, uncover issues and challenges, and reflect on and improve the practice. Additionally, student feedback can serve as valuable experience and guidance for future teaching practices, providing reference and direction for future instructional strategies.

3.4.4 Reflection and Improvement of Teaching Practice

After the teaching practice is completed, teachers need to reflect on and improve the practice. By evaluating teaching effectiveness and analyzing student feedback, teachers can identify issues and shortcomings in the teaching practice and consider ways to enhance and refine it.

First, teachers should consider how to better utilize AI technology to support English writing instruction. This includes how to more accurately identify students' learning needs and ability levels, how to design writing tasks that align with students' interests and course requirements, and how to more effectively use AI-generated personalized feedback and guidance.

Second, teachers should think about how to improve students' cross-cultural communication skills. This involves guiding students to focus on cultural differences, understand cultural diversity, and develop cross-cultural communication abilities. In the teaching process, teachers can help students broaden their cultural perspectives and cross-cultural communication skills by introducing materials and model essays from different cultural backgrounds and organizing cross-cultural exchange activities. Finally, teachers should address the deficiencies and issues identified in the teaching practice. This includes improving teaching quality and efficiency, stimulating students' interest and initiative, and solving problems encountered by students during learning. During the improvement process, teachers should actively listen to students' opinions and suggestions and continuously adjust and refine teaching plans and methods.

Through this process of reflection and improvement, teachers can enhance their teaching skills and provide higher-quality and more effective English writing instruction. Additionally, reflecting on and improving teaching practices can offer valuable experience and insights for future practices, promoting ongoing development and innovation in teaching.

4. Conclusion

4.1 Significant Advantages of AI Technology

Through the practical exploration of integrating AI into English writing instruction in the course of *Zhanjiang Marine Culture*, we have deeply experienced the significant advantages of AI technology in English writing education. These advantages are reflected not only in the richness of teaching resources and the realization of personalized instruction but also in the notable enhancement of students' higher-order thinking and cross-cultural communication skills.

First, AI technology can quickly generate a vast amount of multimodal corpora and model essays

related to marine culture^[1]. These corpora and essays cover a wide range of marine culture topics and are presented in various forms such as text, images, and videos, greatly enriching teaching resources. Students can gain a more intuitive understanding of marine culture through these multimodal materials, broadening their cultural perspectives and enhancing cross-cultural awareness. Second, AI technology can provide personalized learning support and feedback based on students' learning needs and ability levels^[3]. For example, using AI models such as ChatGPT 3.5, teachers can generate writing tasks tailored to students' specific levels and interests, and provide customized model essays and writing guidance. This personalized approach better meets students' learning needs, stimulates their interest, and encourages proactive learning. Additionally, AI technology can offer real-time, accurate feedback. During the writing process, students can use AI models to assess and improve their work. This immediate feedback mechanism helps students promptly identify and correct mistakes, improving their writing skills. By comparing their work with AI-generated model essays, students can gain a clearer understanding of their shortcomings and identify areas for improvement.

4.2 Enhancement of Higher-Order Thinking and Cross-Cultural Communication Skills

The application of AI technology in English writing instruction not only improves students' writing skills but also enhances their higher-order thinking and cross-cultural communication abilities.

In terms of higher-order thinking, AI technology encourages students to engage in critical thinking and creative writing^[6]. By analyzing AI-generated model essays, students can identify logical flaws and potential biases in the texts, thereby improving their critical thinking skills. Additionally, students can draw inspiration from AI-generated texts, incorporating their own styles and unique content to produce innovative writing. This process of creative writing not only fosters students' creativity but also hones their logical reasoning abilities.

Regarding cross-cultural communication skills, AI technology helps students broaden their cultural perspectives and enhance cross-cultural awareness by providing materials and model essays from diverse cultural backgrounds. By comparing language expressions and writing styles across different cultures, students gain a deeper understanding of cultural differences and improve their sensitivity and adaptability to various cultures. Furthermore, AI technology can simulate cross-cultural communication scenarios, offering students practical opportunities to develop and refine their cross-cultural communication skills.

4.3 Provision of New Ideas and Methods for English Writing Instruction

The introduction of AI technology offers new ideas and methods for English writing instruction. Traditional English writing teaching often faces limitations due to restricted teaching resources and insufficient personalized instruction, but AI technology can effectively address these issues. By utilizing generative AI technology to create multimodal corpora and model essays, and providing personalized learning support and feedback, teachers can design teaching plans and methods more flexibly, enhancing the quality and efficiency of instruction. Moreover, AI technology can bring innovative teaching approaches to English writing instruction. For example, teachers can use AI models to design virtual writing scenarios and role-playing activities, allowing students to practice writing and cross-cultural communication in simulated real-world environments. This innovative teaching method can stimulate students' interest and initiative, enhancing their learning experience and outcomes.

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