THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN TEACHING WRITING SKILLS TO ENGLISH MAJOR STUDENTS AT THE NATIONAL ACADEMY OF PUBLIC ADMINISTRATION: BENEFITS AND CHALLENGES

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Abstract: *Artificial intelligence (AI) has become a key educational tool in the digital age. This study explores AI's integration into teaching writing skills to English majors at the National Academy of Public Administration, focusing on its benefits and challenges. Using a mixed-methods approach, the research combines quantitative and qualitative data. In particular, a survey of 150 students shows a significant improvement in writing scores, increasing from an average of 5.4/10 to 7.9/10 after using AI tools. Qualitative data from interviews and classroom observations reveal that AI provides prompt feedback, reduces instructors' workload, and supports personalized learning. However, challenges such as high costs, accessibility issues, and inconsistent feedback quality are noted. The findings demonstrate significant improvements in writing skills with AI, but challenges related to accessibility and feedback quality must be addressed. This study clarifies AI's role in writing instruction and offers recommendations for enhancing technology's use in education.*

Keywords: *Artificial intelligence (AI); Teaching writing skills; English major students; Benefits; Challenges; Personalized learning.*

I. Introduction

In the digital age, artificial intelligence (AI) has emerged as a transformative force across various domains, including education. AI technologies are increasingly integral to enhancing teaching and learning processes, offering new opportunities to elevate educational quality. Specifically in language education, AI can support learners in acquiring vocabulary, mastering grammar, and developing writing skills-areas that are often challenging for English learners.

Writing, a cornerstone of effective communication, is vital for both academic achievement and future career prospects. Proficiency in writing not only underpins academic success but also establishes a strong foundation for professional growth. Despite its importance, teaching writing skills presents significant challenges due to the complexity of structure, grammar, and expression involved.

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Traditional approaches to writing instruction require considerable time and effort from educators, who must grade assignments, provide feedback, and guide students in refining their writing. Students, in turn, face obstacles such as limited vocabulary, incomplete understanding of grammatical rules, and difficulty organizing their ideas coherently.

AI offers promising solutions to these challenges. AI tools can deliver rapid, detailed feedback, tailor learning experiences to meet individual needs, and efficiently enhance students' writing abilities. However, the adoption of AI in education also brings challenges, including concerns about cost, accessibility, and maintaining teaching quality.

This study aims to investigate the advantages and limitations of integrating AI into writing instruction for English primary students at the National Academy of Public Administration. It will provide recommendations for optimizing AI use in educational settings to improve the quality of writing instruction. The research seeks to advance understanding of AI's role in writing education and propose practical strategies to address challenges and effectively leverage this technology's benefits.

II. Theoretical background

2.1. Artificial intelligence in education

** Concepts*

Artificial Intelligence (AI), a branch of computer science, focuses on creating systems capable of performing tasks that typically require human intelligence. These systems learn from experience, adapt to new information, and execute complex functions like image recognition, natural language processing, and decision-making. Definitions of AI vary, emphasizing different facets of the technology.

Stuart Russell and Peter Norvig (2014) describe AI as the study of intelligent agents -systems that perceive their environment and act to maximize success. Yoshua Bengio (2016) defines AI as computer systems performing intricate tasks once exclusive to humans, achieved through advanced machine learning. Andrew Ng (2018) views AI as the creation of algorithms that learn and execute tasks without explicit programming. Fei-Fei Li (2020) sees AI as an interdisciplinary field merging computer science, statistics, mathematics, and cognitive science to develop systems capable of learning and reasoning. Kate Crawford (2021) broadens AI's scope, defining it as a complex system integrating software, hardware, and data for task automation and decision-making.

These definitions illustrate that AI is a multifaceted and evolving field. It involves the development of intelligent systems capable of undertaking complex tasks traditionally associated with human intelligence. Beyond being a technology, AI represents an interdisciplinary approach, combining elements from computer science, machine learning, statistics, mathematics, and cognitive science. This complexity underscores AI's potential to transform various work and learning aspects while presenting significant technical, ethical, and social challenges.

** Types of Artificial Intelligence*

Artificial Intelligence (AI) is central to modern science and technology, transforming machine interactions with human activities. The main types of AI include:

Narrow AI: Weak AI is designed for specific tasks like image recognition or language processing, with capabilities limited to its programmed functions.

General AI: Also called Artificial General Intelligence (AGI), it aims to perform any intellectual task a human can, though it remains under development.

Superintelligent AI: This surpasses human intelligence across all areas, posing potential benefits and significant ethical concerns.

Machine Learning: A branch of AI focused on creating algorithms that enable machines to learn from data without explicit programming, applied in voice recognition and product recommendations.

Deep Learning: A subset of machine learning, it uses deep neural networks to analyze large datasets, improving accuracy in tasks like image and language recognition.

Self-Learning AI: This AI autonomously improves its processes and performance without external input.

AI not only creates new opportunities but also introduces challenges. In language education, AI can enhance teaching and learning methods, offering students more personalized and practical experiences.

2.2. Artificial Intelligence in language teaching and learning

Artificial Intelligence (AI) has rapidly advanced, becoming integral to education by providing personalized learning experiences. A UNESCO report (2020) highlights AI's role in enhancing education quality and reducing global disparities in learning opportunities.

In language teaching, AI provides significant benefits. It customizes learning by adapting content to each student's proficiency and learning style, offering immediate feedback to correct errors. Tools such as language apps, chatbots, and online platforms enable continuous practice. Research from EdTechXGlobal (2022) reveals AI's positive impact on learning outcomes, particularly in listening and speaking skills.

Advanced tools like Duolingo, Babbel, and Rosetta Stone utilize AI to tailor lessons and optimize language acquisition. Research from Carnegie Mellon University shows that Duolingo's AI-driven approach leads to more effective learning than traditional methods.

Chatbots and virtual assistants, such as Siri, Alexa, and Google Assistant, offer interactive practice and instant feedback, enhancing language skills in a flexible environment. Google Assistant, for example, helps improve pronunciation and grammar, especially for learners who lack access to native speakers.

Online platforms like Coursera and edX leverage AI to personalize courses, automate grading, and monitor student progress, thereby increasing learning efficiency. However, AI's application in language teaching faces challenges such as high costs, data security concerns, and unequal access to technology. Addressing these challenges requires comprehensive strategies, including teacher training, technological investment, and supportive policies to realize AI's full educational potential.

2.3. Artificial intelligence in teaching and learning writing skills

Artificial Intelligence (AI) is increasingly integral to education, offering tools that enhance personalized learning and streamline classroom management. AI provides intelligent feedback and assessments in teaching writing skills, helping students improve through automated error detection and writing suggestions. Writing, essential in both academic and professional contexts, reflects one's communication abilities while fostering critical thinking and creativity. AI tools, such as grammar

checkers and text analysis systems, facilitate understanding and applying writing principles, thereby supporting the development of both basic and advanced writing skills.

AI technologies like Grammarly and ProWritingAid detect grammatical errors, sentence structures, and writing styles, significantly improving writing quality and offering detailed feedback (Persing & Ng, 2016). AI writing assistants, such as GPT-3 and GPT-4, generate high-quality text and enhance content, while text analysis systems assess coherence and logic, aiding students in refining their writing style and self-editing capabilities.

The integration of AI in teaching writing skills offers several benefits. AI provides immediate feedback, enabling students to improve rapidly (He et al., 2022), and reduces teachers' workload, allowing for more creative and interactive teaching. Additionally, AI promotes personalized learning by tailoring suggestions to individual student needs.

However, challenges persist. AI accuracy requires human oversight, as it can struggle with understanding text semantics and context (Liu & Zhang, 2018). Over-reliance on AI may also hinder students' writing abilities. Despite these challenges, AI is expected to advance, offering more sophisticated tools while teachers remain crucial in guiding students (Hsu & Ching, 2021). Combining AI with teacher support will create a more effective learning environment, enhancing both technology and traditional educational methods.

III. Research methodology

3.1. Research settings

The National Academy of Public Administration is one of Vietnam's leading educational institutions, tasked with providing high-quality human resources for the public administrative system. Language-major students at the Academy not only require specialized knowledge but must also master language skills, particularly English writing skills, to meet both domestic and international job demands. However, teaching writing skills faces significant challenges due to large class sizes, limited time for personalized feedback, and constraints in writing support tools. In this context, artificial intelligence (AI) has emerged as a potential solution to enhance the quality of writing instruction. AI can provide rapid, detailed feedback, personalize the learning process, and reduce the workload for instructors. The application of AI in teaching writing skills at the Academy is expected to be a breakthrough, offering opportunities to improve the overall quality of learning. This study aims to assess the effectiveness of integrating AI into the teaching process and the benefits and challenges this technology brings to the Academy's educational environment. Through AI, the Academy hopes to improve students' writing skills and optimize the training process to meet the growing demands of the public administration sector in the digital era.

3.2. Research design

This study adopts a mixed-methods approach to comprehensively examine the benefits and challenges of integrating artificial intelligence (AI) in teaching writing to language-significant students at the National Academy of Public Administration. The design incorporates both quantitative and qualitative methods.

The quantitative phase involves data collection from 150 English language primary students, comprising 45% first-year, 35% second year, and 20% third-year students. This phase evaluates the effectiveness of AI tools and student

feedback on these tools in writing instruction.

The qualitative phase delves into students' experiences with AI tools through in-depth interviews and classroom observations, including 20 students who also participated in the quantitative survey.

2.2. Data collection instruments

Three primary tools are utilized for data collection: questionnaires, in-depth interviews, and observations.

Questionnaires: Designed to assess students' perceptions, attitudes, and experiences with AI tools. It includes 15 questions, including ten multiple-choice questions for quantitative data on AI tool satisfaction and effectiveness and 5 open-ended questions for qualitative insights into challenges and benefits. Distribution is through online and classroom channels.

In-depth Interviews: Conducted with 20 students to gather detailed insights into their use of AI tools, encountered difficulties, and applied strategies. Interviews are recorded and transcribed for analysis.

Classroom Observations: These assess the application of AI tools in teaching, monitoring student interaction and practical application while capturing direct feedback.

2.3. Data analysis methods

Quantitative data from questionnaires will be analyzed using SPSS, employing descriptive and regression analysis. Reliability is ensured by calculating Cronbach's Alpha, which is considered acceptable with a value above 0.7. Qualitative data from interviews and observations will undergo content analysis, identifying themes such as confidence, critical thinking, and challenges in AI tool usage.

IV. Findings and Discussion

3.1. Quantitative results and analysis

Data from 150 students revealed significant improvements in writing skills after using AI tools. Initially, the average writing score was 5.4/10 (SD = 0.85), which rose to 7.9/10 (SD = 0.78) post-intervention—a 46% increase. The difference is statistically significant, with a $t(149)$ value of 14.92 ($p < 0.001$), indicating that the improvement is unlikely due to chance. The effect size, Cohen's $d = 1.4$, underscores the substantial impact of AI on writing enhancement.

Despite these gains, 35% of students cited cost and accessibility issues as barriers, while 28% struggled with interpreting AI feedback, which they found unclear or complicated to apply. Another 22% believed the feedback needed more detail, limiting its utility in addressing their specific needs.

Student satisfaction varied by academic year: 78% of first-year students responded positively, attributing their enthusiasm to the novelty of the technology. Among second-year students, 70% recognized the benefits, though some needed more guidance to leverage the tool entirely. Satisfaction dropped to 65% among third-year students, who felt the AI did not meet their advanced writing needs. These findings highlight the need for better accessibility, more precise feedback, and enhanced tools for more complex writing tasks.

3.2. Qualitative results and analysis

Interviews with 20 students provided further insights into AI tools' effects on writing. Many students appreciated the tools' ability to quickly and accurately identify spelling, grammar, and sentence structure errors, often outperforming self-checks or instructor feedback. The tools

also helped improve essay structure by offering suggestions for organizing ideas and arguments more logically.

However, some students encountered challenges in applying AI feedback, noting that it was sometimes vague or lacked alignment with their essay's context, especially in creative or nuanced writing tasks. Students sought additional resources and peer support to understand better and use AI tools effectively. This communal learning approach helped some students integrate feedback more thoroughly.

Classroom observations revealed varied use of AI tools. While some students actively revised their work based on feedback, others made only superficial changes. This discrepancy suggests that while AI tools have potential, their effectiveness depends on the student's ability to interpret and apply the feedback meaningfully.

V. Conclusion

This study has demonstrated that the application of artificial intelligence (AI) in teaching writing skills to language-major students at the National Academy of Public Administration offers significant benefits but also presents several challenges that need to be addressed.

The quantitative analysis indicates a notable improvement in students' writing scores following the implementation of AI tools. The average score increased from 5.4/10 to 7.9/10, reflecting an average improvement of 2.5 points, or 46%. This improvement is substantial (Cohen's $d = 1.4$) and statistically significant ($p < 0.001$), confirming that the AI tool has a positive and significant impact on students' writing skills.

The primary benefits observed by students include: (1) AI tools are effective in detecting spelling, grammar, and sentence structure errors more quickly than self-checking or instructor feedback; and (2) AI aids in organizing ideas and developing arguments more coherently.

However, the study also reveals several challenges: (1) 35% of students experienced difficulties related to the cost or accessibility of technology, impeding the widespread adoption of AI tools; (2) 28% of students found AI feedback to be unclear or insufficiently detailed, affecting their ability to apply the feedback to their writing; and (3) AI struggled with understanding and processing subtle semantic elements and personal writing styles, particularly in complex or creative writing.

Qualitative analysis shows that many students sought additional resources and guidance from external sources to enhance their use of AI tools. Variations in the application of AI feedback highlight the need for further support and guidance to maximize the tool's effectiveness.

Based on these findings, the following recommendations are proposed:

Firstly, the National Academy of Public Administration should consider providing financial support or discount packages to alleviate the cost burden associated with AI tools. This could include direct subsidies for software or discounts on AI services. Such measures would reduce costs for students and promote broader adoption of AI technology in the educational setting.

Secondly, the National Academy of Public Administration should collaborate with AI tool providers to obtain free or low-cost versions specifically for students. Additionally, the Academy should actively engage in cooperative programs to ensure that the AI tools are most appropriate and effective for students. Gathering feedback from students and instructors is essential

to refine the tools and support methods. Regular studies should be conducted to assess the effectiveness of AI tools and update them according to user needs and feedback, including evaluations of new technological trends to keep the tools current and aligned with advancements.

Thirdly, developing or selecting AI tools that offer more detailed and contextually appropriate feedback for students' writing is important. This could involve integrating additional feedback modules tailored to specific types of writing, such as dissertations, essays, or research reports. These tools should be adapted to meet the specific needs of various writing types and students' developmental levels.

Fourthly, training courses should be provided for students on how to understand and effectively utilize AI feedback. This could include online tutorials or on-campus workshops, along with comprehensive guides and instructional videos to help students become familiar with AI tool features. Regular training sessions should be organized with the involvement of experts in educational technology to ensure quality and effectiveness.

Fifthly, instructors should complement AI feedback with personalized guidance to help students better understand how to improve their writing. This approach can address issues related to the clarity of AI feedback and provide specific instructions and practical examples on applying the feedback. They can hold individual or small group meetings to discuss AI feedback and strategies for writing improvement.

Last but not least, students should be encouraged to join study groups and discussions about using AI tools to share experiences and support each other. This can be facilitated through online forums, formal study groups, or academic clubs at the school. These groups will help them feel supported, learn from each other, and foster a positive learning community.

In summary, while the application of artificial intelligence in teaching writing skills has proven beneficial in enhancing students' writing abilities, addressing the identified challenges is crucial for achieving optimal results. Implementing these recommendations will help optimize the use of AI in teaching, improve the quality of writing education for language-major students at the National Academy of Public Administration, and ultimately enhance students' academic performance and readiness in an evolving learning environment.

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ỨNG DỤNG TRÍ TUỆ NHÂN TẠO TRONG GIẢNG DẠY KỸ NĂNG VIẾT CHO SINH VIÊN CHUYÊN NGỮ CỦA HỌC VIỆN HÀNH CHÍNH QUỐC GIA: LỢI ÍCH VÀ THÁCH THỨC

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Tóm tắt: *Trong kỷ nguyên số, trí tuệ nhân tạo (AI) đã trở thành công cụ quan trọng trong giáo dục. Nghiên cứu này tập trung vào việc ứng dụng AI trong giảng dạy kỹ năng viết cho sinh viên chuyên ngữ tại Học viện Hành chính Quốc gia, nhằm phân tích các lợi ích và thách thức mà công nghệ này mang lại. Nghiên cứu sử dụng thiết kế kết hợp phương pháp định lượng và định tính. Phương pháp định lượng qua khảo sát 150 sinh viên cho thấy điểm kỹ năng viết tăng từ 5.4/10 lên 7.9/10 sau khi sử dụng công cụ AI. Phân tích định tính từ phỏng vấn và quan sát lớp học cho thấy AI giúp phản hồi nhanh chóng, tiết kiệm thời gian giảng viên và hỗ trợ học tập cá nhân hóa. Tuy nhiên, thách thức bao gồm chi phí cao, khó khăn tiếp cận và chất lượng phản hồi chưa hoàn hảo. Kết quả cho thấy AI cải thiện rõ rệt kỹ năng viết, nhưng cần giải quyết vấn đề về khả năng tiếp cận và chất lượng phản hồi để tối ưu hóa hiệu quả. Nghiên cứu không chỉ làm rõ vai trò của AI trong giảng dạy mà còn đưa ra các đề xuất để nâng cao hiệu quả ứng dụng công nghệ trong giáo dục.*

Từ khóa: *Trí tuệ nhân tạo (AI); Giảng dạy kỹ năng viết; Sinh viên chuyên ngữ; Lợi ích; Thách thức; Cá nhân hóa học tập.*

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