

Artificial Intelligence Applications in Higher Education Teaching in Southern Vietnam: Current Trend, Opportunities, and Challenges

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ABSTRACT: The rapid development of artificial intelligence, particularly generative AI, is transforming the way teaching, assessment, and learning management are organized in higher education. Numerous studies indicate that AI has the potential to support personalized learning, automate feedback, improve assessment, and enhance the effectiveness of instructional design in higher education settings (Holmes et al., 2019; Ogunleye et al., 2024). In southern Vietnam, home to many major higher education institutions, the application of AI in teaching is taking place in various forms; however, the implementation process still faces numerous challenges. This study employs a traditional literature review method to analyze the current status, opportunities, and challenges of applying AI in university teaching in southern Vietnam. From there, the article offers recommendations for faculty members, students, universities, and government agencies responsible for higher education.

KEYWORDS: Artificial Intelligence (AI), Higher Education, University Teaching, Vietnam, Digital Transformation in Education.

INTRODUCTION

In the context of digital transformation in education, artificial intelligence is becoming one of the technologies with the most far-reaching impact on higher education. AI can assist instructors in designing lessons, creating question banks, analyzing learning progress, providing personalized feedback, and supporting students' self-directed learning (Holmes et al., 2019; Zhai, 2024). In particular, the widespread adoption of generative AI tools such as ChatGPT, Gemini, Claude, Copilot, and intelligent tutoring systems has transformed how students access knowledge, complete assignments, write academic papers, and engage with learning content (Ogunleye et al., 2024; Sharples, 2023).

Recent studies indicate that generative AI in higher education not only opens up potential for innovative teaching methods but also raises new issues regarding academic integrity, data privacy, algorithmic bias, and information literacy (Chan, 2023; Perkins et al., 2024). According to UNESCO (2023), the use of AI in education must be grounded in a human-centered framework, ensuring equity, transparency, data security, and academic accountability.

In Vietnam, higher education is facing a dual challenge: on the one hand, there is a need to improve the quality of education, learning outcomes, and international competitiveness; on the other hand, there is pressure to adapt to digital technology and new labor market demands. Several studies on Vietnamese higher education indicate that AI can help improve teaching quality, personalize learning pathways, and enhance assessment, but the implementation process still faces challenges related to infrastructure, digital capabilities, policies, and the awareness of stakeholders (Doan et al., 2024; Ly, 2026; Phan et al., 2025).

Southern Vietnam is a region with a dynamic higher education ecosystem, home to numerous public, private, international, and applied-oriented institutions. This environment facilitates the testing of AI in teaching but also highlights disparities among these institutions regarding resources, infrastructure, policies, and faculty readiness. Therefore, researching the current status, opportunities, and challenges of AI in higher education in Southern Vietnam holds significance both theoretically and practically.

Based on this context, this study focuses on addressing three key questions:

1. What is the current state of AI application in university teaching in southern Vietnam?
2. What opportunities does AI present for innovation in teaching, learning, and assessment methods?
3. What challenges need to be identified to implement AI effectively, safely, and responsibly?

RESEARCH METHOD

The study employs a qualitative literature review combined with thematic analysis. This approach is well-suited to rapidly evolving fields such as AI in education, where empirical data remains scattered, implementation models are still unstable, and the research evidence base continues to expand (Ogunleye et al., 2024).

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The literature was synthesized from three main groups of sources. First, international studies on AI in higher education, generative AI, assessment and evaluation, personalized learning, and faculty AI competencies were synthesized from the Google Scholar database over the past five years. Next, studies relevant to Vietnam were filtered, including AI in online education, AI in Vietnamese higher education, and studies on implementation barriers in the Vietnamese context. Concurrently, we integrated policy-oriented documents and international recommendations, particularly UNESCO's materials on AI in education, AI ethics, and the responsible use of generative AI (UNESCO, 2023, 2024), to develop appropriate recommendations for the target users.

Analytical Methodology

The analysis is based on a comparison between international evidence and local characteristics. For Southern Vietnam, the materials were analyzed according to four thematic groups:

- (1) The current state of AI application in teaching;
- (2) Opportunities for AI application in teaching;
- (3) Challenges in implementing AI applications in teaching at universities;

THE CURRENT STATE OF AI APPLICATION AT UNIVERSITIES IN SOUTHERN VIETNAM

Analysis AI Application in University Teaching in Southern Vietnam

Overall findings indicate that the application of AI in university teaching in Southern Vietnam is in a transitional phase, shifting from spontaneous to more structured use. In the early stages, many faculty members and students accessed AI through popular tools such as ChatGPT, Grammarly, QuillBot, Canva AI, Copilot, Gemini, or online learning platforms with integrated data analysis features. This trend aligns with the observation that generative AI is being used increasingly widely in higher education, though the degree of institutionalization varies across educational institutions (Chan, 2023; Ogunleye et al., 2024). Trong hoạt động giảng dạy, AI được sử dụng phổ biến ở các khâu như tìm kiếm tài liệu, thiết kế đề cương bài giảng, tạo ví dụ minh họa, xây dựng câu hỏi trắc nghiệm, hỗ trợ phản hồi bài viết, dịch thuật học thuật và gợi ý hoạt động học tập. Đối với sinh viên, AI thường được dùng để tóm tắt tài liệu, giải thích khái niệm khó, luyện viết, hỗ trợ lập trình, dịch văn bản và chuẩn bị bài thuyết trình. Các hình thức sử dụng này phản ánh vai trò ngày càng lớn của AI như một công cụ hỗ trợ học tập phi chính thức nhưng có tác động mạnh đến quá trình tiếp cận tri thức của người học (Holmes et al., 2019; Sharples, 2023).

However, the integration of AI into formal training programs remains limited. At many institutions, AI has not yet been incorporated as a mandatory component in learning outcomes, assessment rubrics, academic integrity policies, or faculty development programs. Studies in Vietnam also indicate that the application of AI in higher education faces challenges due to a lack of guiding policies, infrastructure limitations, implementation costs, and uneven technological proficiency (Doan et al., 2024; Lý, 2026; Phan et al., 2025).

Analysis of AI's Opportunities for Higher Education Innovation

The first opportunity is personalized learning. AI can help create learning pathways tailored to each student's level, pace, and needs. In large classes, particularly in general education or skills-based courses, instructors often struggle to provide personalized feedback to each learner. AI can help analyze common mistakes, suggest supplementary materials, and provide immediate feedback at the initial stage (Holmes et al., 2019; Lý, 2026). In the context of online education in Vietnam, AI is also viewed as a tool capable of optimizing learning pathways and providing automated support for learners (Phan et al., 2025).

The second opportunity is to enhance the effectiveness of instructional design. AI helps instructors save time in developing learning materials, creating discussion scenarios, designing questions, suggesting practical examples, and converting content into various formats. According to Zhai (2024), the emergence of generative AI is transforming the role of instructors from knowledge transmitters to designers, coordinators, and evaluators of the learning process. For universities in Southern Vietnam with an applied focus, AI can help integrate business scenarios, local contexts, and real-world problems into the classroom more quickly.

The third opportunity lies in innovating assessment practices. Rather than focusing solely on detecting whether students are using AI, schools can shift toward designing assessments that allow for varying degrees of AI use. Perkins et al. (2024) propose the AI Assessment Scale to classify levels of AI use in assessment, ranging from no AI use to full AI integration. This approach suggests that an outright ban on AI may no longer be appropriate in a context where generative AI has become a common tool, while the ability to use AI responsibly is an important part of future professional competence (Perkins et al., 2024).

The fourth opportunity is to develop digital and AI competencies for students. In the context of a rapidly changing labor market, students need not only specialized knowledge but also the ability to interact with intelligent systems, evaluate the quality of information, ask effective questions, identify biases, and take responsibility for the final product. Long and Magerko (2020) argue that AI literacy encompasses the ability to understand, use, evaluate, and critically engage with AI systems. Therefore, AI should be integrated as a cross-disciplinary competency in higher education, not limited to information technology students.

Analysis of the Challenges in Implementing AI in Universities

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The most prominent challenge is academic integrity. Generative AI is capable of writing essays, solving homework problems, creating code, and summarizing documents, making the line between academic support and academic dishonesty difficult to define. Studies on AI in university assessment show that responses relying solely on bans or penalties are often ineffective, as students can still access AI tools outside the university's control (Chan, 2023; Perkins et al., 2024). Therefore, the core issue is not merely detecting cheating, but redesigning assessments to require students to demonstrate their thought processes, critical thinking skills, and ability to defend their arguments.

The second challenge is faculty members' AI literacy. Not all faculty members possess sufficient understanding of AI's operational principles, limitations, risks, and how to leverage it within their respective disciplines. Without proper training, faculty may fall into two extremes: either banning AI entirely due to risk concerns, or using AI without proper verification and ethical standards. UNESCO (2024) emphasizes that teachers and faculty need to be equipped with AI competencies to use the technology responsibly, fairly, and in alignment with educational objectives.

The third challenge is technology and data infrastructure. Some major universities in Ho Chi Minh City have the resources to implement LMS systems, digital libraries, assessment software, and online learning platforms. However, not all educational institutions in the South have the same level of infrastructure. Differences in internet connectivity, devices, software licensing, data management capabilities, and technology budgets can create new disparities among institutions. Studies on the Vietnamese context also indicate that infrastructure limitations and investment costs are significant barriers to AI implementation in higher education (Doan et al., 2024; Ly, 2026; Phan et al., 2025).

The fourth challenge is the reliability of AI-generated content. AI can produce inaccurate information, non-existent documents, fabricated citations, or context-deficient interpretations. In higher education, this risk is particularly severe because students may confuse fluent text with reliable knowledge. Sharples (2023) emphasizes that the use of AI in education must be accompanied by critical thinking skills, the ability to verify information, and a clear understanding of the limitations of AI systems.

The fifth challenge concerns ethics, privacy, and data security. When students or faculty upload personal data, assignments, research information, or internal documents to commercial AI platforms, the risk of data breaches may arise. UNESCO (2023) emphasizes that the use of generative AI in education must protect privacy, data security, fairness, and human responsibility in educational decision-making. This is a particularly critical issue for universities as they implement AI in learning management, student data analysis, and automated assessment.

DICUSSION

Research findings indicate that the use of AI in higher education in southern Vietnam is not merely a technological issue but rather one of educational governance, pedagogical competence, and academic culture. If AI is merely provided as a tool without changing teaching methods, it may increase dependency, encourage rote memorization, and undermine independent thinking. Conversely, if strategically integrated, AI can help shift the focus of teaching from content delivery to the development of problem-solving, critical thinking, and creativity skills (Holmes et al., 2019; Zhai, 2024).

A key point is the need to shift from a “detect and ban” mindset to a “transparency and redesign” mindset. Completely banning AI from all learning activities is no longer appropriate for the future professional environment, where students will need to work alongside intelligent systems. Perkins et al. (2024) argue that higher education institutions should develop flexible assessment frameworks that clearly define the extent to which AI is permitted in each learning task. This approach helps maintain academic integrity while still leveraging the potential of AI in educational innovation.

For Southern Vietnam, a major advantage is the dynamism of its education, business, and technology ecosystems. Universities in Ho Chi Minh City, Binh Duong, Dong Nai, Can Tho, and neighboring regions can develop collaborative models with technology companies to establish educational AI labs, adaptive learning platforms, open educational resources, and faculty development programs. However, technology partnerships must be accompanied by data protection principles, algorithmic transparency, and the avoidance of reliance on a single provider (UNESCO, 2023).

From an educational perspective, AI should be integrated into three categories of activities. First, before class, where AI assists teachers in preparing content, analyzing learner needs, and designing activities. Second, during class, where AI supports discussions, scenario simulations, immediate feedback, and interactive learning. Third, after class, where AI supports review, personalized feedback, progress analysis, and academic advising. This approach aligns with the view that AI serves as a pedagogical tool rather than a replacement for the instructor's role (Holmes et al., 2019; UNESCO, 2024).

From an assessment perspective, schools should prioritize assessment methods that are difficult for AI to fully replace, such as oral presentations, learning journals, projects based on local data, group projects with peer review, interviews, and formative assessments. At the same time, students should be required to clearly disclose the extent of AI use in their work, including the tools used, the purpose of use, and which parts of the product were supported by AI. This approach aligns with recommendations regarding transparency and academic accountability in higher education during the era of generative AI (Chan, 2023; Perkins et al., 2024).

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CONCLUSION

Research shows that the application of artificial intelligence in university teaching in southern Vietnam is opening up significant opportunities for educational innovation, particularly in personalized learning, faculty support, assessment improvements, and the development of students' digital competencies. These benefits align with international trends regarding AI in higher education, where AI is viewed as a tool to enhance the quality of learning and teaching effectiveness (Holmes et al., 2019; Ogunleye et al., 2024). However, this process also presents numerous challenges related to academic integrity, AI capabilities, technological infrastructure, data security, and the reliability of information. In the Vietnamese context, barriers related to infrastructure, policy, digital skills, and data security require special attention when implementing AI in higher education (Doan et al., 2024; Ly, 2026; Phan et al., 2025).

To implement AI effectively and responsibly, universities in southern Vietnam should follow the following recommendations:

First, develop policies on the use of AI in teaching and learning at the institutional level, clearly defining the permitted levels of AI use, students' disclosure responsibilities, and the principles for handling violations.

Second, develop AI competency training programs for faculty, focusing on designing AI-integrated courses, assessment and evaluation in the context of generative AI, fact-checking, and data ethics.

Third, integrate AI literacy into student learning outcomes, treating it as a foundational competency on par with digital literacy, language proficiency, and lifelong learning skills.

Fourth, invest in technology infrastructure that prioritizes security, interoperability, and the protection of personal data, avoiding the piecemeal implementation of AI driven by trends.

Fifth, promote empirical research at universities in southern Vietnam to measure the impact of AI on academic outcomes, learning motivation, critical thinking skills, and academic integrity.

In summary, AI is not a substitute for the role of instructors, but rather a tool that enhances teaching capabilities when used properly. The focus of higher education in the AI era is not merely on teaching students how to use tools, but on helping them learn to ask questions, verify knowledge, take academic responsibility, and use technology to achieve sustainable learning outcomes.

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