

Integrating Artificial Intelligence into Higher Education: Opportunities, Ethical Challenges, and a Practical Framework for Teaching Excellence

Le Phuong Truong^{1*}, Nguyen Huu Nghi¹, and Le Duc Thinh¹

¹ Lac Hong University, Vietnam

*Corresponding author's email: lephuongtruong@lhu.edu.vn

 <https://orcid.org/0000-0001-6691-9755>

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ABSTRACT

Keywords: AI; teaching and learning; AI Integration Framework; AI pedagogy

Recent research has examined the integration of Artificial Intelligence (AI) into higher education and its ethical and practical challenges. However, evidence connecting faculty AI practices, perceived barriers, and implementation frameworks remains limited in specific contexts. This study investigates AI integration in teaching and proposes a framework for responsible use. An eight-question survey was administered to 84 faculty members in Health and Languages at two Vietnamese universities. Responses were analyzed using descriptive statistics, while the Connections Circle model explored relationships among factors influencing AI adoption. Overall, 71.4% of respondents used AI for teaching-related activities. Lesson planning and material development were the most common applications (34.5%), followed by student assessment (8.3%). The proposed “AI Integration Framework for Teaching Excellence” combines faculty training, risk management, professional ethics, privacy protection, and knowledge sharing to promote the responsible and effective use of AI in teaching.

Introduction

Artificial intelligence (AI) is a field of computer science research focused on developing computational systems that can mimic human cognition, such as learning, reasoning, and self-correction. Unlike traditional tools, AI systems mimic human intelligence, enabling the performance of complex tasks previously thought to be solely human-capable (Feuerriegel et al., 2024). The shift from mechanical to intelligent systems marks a major technological advance, promising far-reaching impacts across many fields, including higher education. AI is divided into two groups: generative AI and predictive AI. Generative AI uses deep learning models to generate new content such as text, video, and audio based on large datasets. Predictive AI uses statistical models and machine learning algorithms to support decision-making.

Recent studies in Vietnam further show that successful implementation of AI and educational technologies depends not only on technological infrastructure but also on teachers’ professional

competencies and pedagogical practices. Dinh and Nguyen (2026) investigated Vietnamese EFL teachers' Technological Pedagogical Content Knowledge (TPACK) and found that teachers' gender and teaching specialization were significantly associated with their technology integration competence. More importantly, the study suggested that Vietnamese EFL teachers' TPACK could be represented by two major knowledge domains rather than the original seven-domain framework, indicating the complexity of teachers' technological knowledge and the need for context-specific professional development. Complementing this perspective, Tran (2025) examined students' and teachers' attitudes toward code-switching in Vietnamese EFL classrooms and found that both groups perceived code-switching as an effective instructional strategy for improving classroom communication, facilitating lesson comprehension, increasing learners' confidence and motivation, and strengthening teacher–student interaction. These findings suggest that technology-enhanced education requires not only advanced AI tools but also appropriate pedagogical approaches that align with learners' needs and classroom contexts.

Despite these educational benefits, AI integration also presents considerable challenges. Berendt et al. (2020) emphasized concerns regarding ethics, data privacy, and responsible AI use in education, while Chen et al. (2020) argued that although AI can improve assessment and lifelong learning, its implementation requires appropriate ethical governance. Similarly, Lamerias and Arnab (2021) warned that excessive reliance on AI technologies may weaken interactions between teachers and learners, highlighting the importance of balancing technological innovation with human-centered pedagogy. Table 1 summarizes previous studies on artificial intelligence and technology-enhanced education.

Table 1.

summarizes previous studies on artificial intelligence in education

References	Research Objective	Research Method	Findings
Feuerriegel et al. (2024)	Clarify the role of AI in simulating and extending human cognitive capabilities.	Literature review and theoretical analysis of AI development.	AI has a significant impact on many fields, including higher education.
Beege et al. (2024); Schubert et al. (2025)	Investigate the role of generative AI in education.	Analysis of generative AI applications in content design and teaching methods.	Generative AI contributes to the innovation of teaching methods and supports the creation of educational materials.
Aljabr et al. (2024);	Evaluate the impact of AI-powered language tools on language learning.	Study of AI applications in conversational practice, translation, and academic writing.	AI supports communication practice, translation, and enhances multilingual academic writing skills.
Simms et al. (2025)	Examine the impact of generative AI on nursing students.	Analysis of the requirements for critical evaluation skills and ethical awareness in AI use.	Students need to be equipped with critical evaluation skills and ethical awareness when using generative AI.
Zulfiqar et al. (2025)	Investigate the impact of AI-integrated teaching approaches in	Study of AI integration into business teaching activities.	AI increases student engagement and promotes students'

	business education.		entrepreneurial intentions.
Velari et al. (2025)	Investigate the use of ChatGPT in STEM disciplines, particularly biology.	Upper-secondary STEM students' ChatGPT use, perceptions, and AI knowledge, with biology as a prominent use context.	Develop effective strategies for using AI in learning.
Holmes & Tuomi (2022)	Analyze the role of AI in personalized learning and educational management.	Review of adaptive learning systems and learning data analysis.	AI helps personalize learning content, supports data-driven decision-making, and improves the learning environment.
Paek & Kim (2021)	Synthesize global research trends on AI in education.	Literature review and trend analysis.	AI supports teaching through automation tools and expands opportunities for flexible access to education.
Berendt et al. (2020)	Analyze ethical challenges and data privacy issues in the application of AI in education.	Theoretical analysis and review of AI-related ethical issues.	The application of AI in education requires attention to personal data protection and ethical responsibility.
Chen et al. (2020)	Investigate the potential and risks of AI in assessment and lifelong learning.	Analysis of AI applications in education and assessment.	AI can innovate assessment methods and support lifelong learning, but ethical issues need to be controlled.
Lameras & Arnab (2021)	Examine the risk of excessive dependence on technology in teaching.	Analysis of the role of technology in teaching and learning relationships.	Excessive use of AI may reduce interaction between teachers and learners.

Table 1 show the different aspects of AI use in education, from content creation in teaching and learning to developing teaching and learning strategies to improve the quality of teaching and learning.

In summary, integrating AI into higher education offers many transformative opportunities to improve teaching quality, while also posing ethical and operational challenges. This paper proposes a framework to address these challenges and harness AI's potential to build a more dynamic, personalized, and effective learning environment. By analyzing the opportunities and limitations of AI in education, the study aims to provide a practical roadmap for educators and policymakers to promote the quality and excellence of higher education.

Methodology

In this study, the research team surveyed 84 instructors from two academic disciplines: Health at Hanoi University of Pharmacy and Language at Lac Hong University. The team selected

these disciplines because they face significant challenges in applying technology in teaching and learning, creating an opportunity to identify suitable solutions.

Survey Design and Sample Selection

- **Sample Selection Criteria:** Instructors were chosen from the Health and Language disciplines because these fields face considerable challenges in integrating technology into teaching. Focusing on these two areas allows for an in-depth exploration of the barriers and the identification of appropriate strategies to enhance the effective use of AI in education.
- **Development and Validation of the Survey Instrument:** The questionnaire was developed with eight key questions aimed at collecting detailed information on:
 1. **Experience with AI:** Assessing the extent to which instructors have used AI tools or software in their teaching and describing the contexts and methods of their use.
 2. **Areas of AI Support:** Identifying the specific aspects of teaching - such as lecture preparation, student assessment, and individualized student support - where instructors believe AI could be most beneficial.
 3. **Concerns Regarding AI Adoption:** Exploring the concerns instructors have about integrating AI in education, including ethical issues and the risk of replacing the traditional role of the instructor.
 4. **Personalization of Learning:** Evaluating the perceived ability of AI to tailor the learning process to meet individual student needs.
 5. **Required Skills Development:** Identifying the skills that instructors believe are necessary to effectively leverage AI in educational settings.
 6. **Role of AI in Enhancing Educational Quality:** Assessing instructors' perceptions of AI's contribution to improving overall educational quality, including its role in managing student data, developing learning content, and supporting instructional activities.
 7. **Cost-Benefit Evaluation:** Evaluating the perceived costs and benefits associated with integrating AI into teaching programs and administrative operations.
 8. **Policies and Regulations:** Gathering instructors' views on the necessary policies or regulatory frameworks required to ensure the safe and effective use of AI in education.

Data Collection Process

Survey Administration: The survey was conducted using Google Forms, which facilitated rapid and convenient data collection. To ensure data security and confidentiality, no personal information was collected; all responses were anonymous and used solely for research purposes. In this study, the survey's Cronbach's Alpha was 0.80, indicating strong internal consistency among the items. This ensures the survey variables are well correlated and reliable for assessing lecturers' perceptions of AI applications in education.

Data Analysis Method

After data collection, the researchers analyzed survey responses using descriptive statistics, including frequencies and percentages, to summarize instructors' AI use, perceived benefits, challenges, concerns, and proposed solutions. Although the total sample comprised 84 instructors, responses to some questionnaire items were optional. Therefore, the number of valid responses varied across items because participants could leave individual questions unanswered. Percentages were calculated using the number of valid responses to each item as the denominator rather than the total sample of 84, unless otherwise specified. Item non-responses were excluded from the denominator for the corresponding question. To ensure transparency and reproducibility, results are reported as frequencies and percentages [n (%)], with the valid denominator (N) specified for each relevant item.

The Connections Circle model (Quaden et al., 2006) was subsequently employed as a systems-thinking tool to visually explore the interrelationships among key factors associated with AI integration in teaching. The survey findings were organized into factors within the circle, and directional links represented their perceived connections. Factors with multiple connections were considered prominent within the mapped system and were used to inform the development of the proposed AI Integration Framework for Teaching Excellence. This analysis was exploratory and descriptive; therefore, no statistical significance or causal relationships were inferred.

Limitations of the Study and Directions for Future Research

One limitation of this study is that the survey sample was confined to instructors from the Health and Language disciplines. As a result, the findings may not be generalizable to other fields such as Economics and Finance. Future research will aim to extend the survey to these additional disciplines to obtain a more comprehensive understanding of AI integration in teaching and educational management.

Results and Analysis

Current Usage of AI Tools

In the context of modern higher education, AI tools have formed a collaborative ecosystem among lecturers, students, and technology, in which each component complements and reinforces the others. This study investigates the extent to which lecturers currently use AI for various pedagogical tasks, as shown in Table 2.

Table 2

Areas of AI Application Among Lecturers

Application	Percentage (%)
Lesson planning, material synthesis, syllabus	34.5
Assessment automation	8.3
Personalized learning	3.6
Research	2.4
Administrative Support	2.3
Student Data Management	20.5
Not using AI	28.6

The survey revealed that 71.4% of lecturers (60/84) had used AI in teaching-related activities, while 28.6% (24/84) had not yet adopted AI. Popular tools included ChatGPT, Quizizz AI,

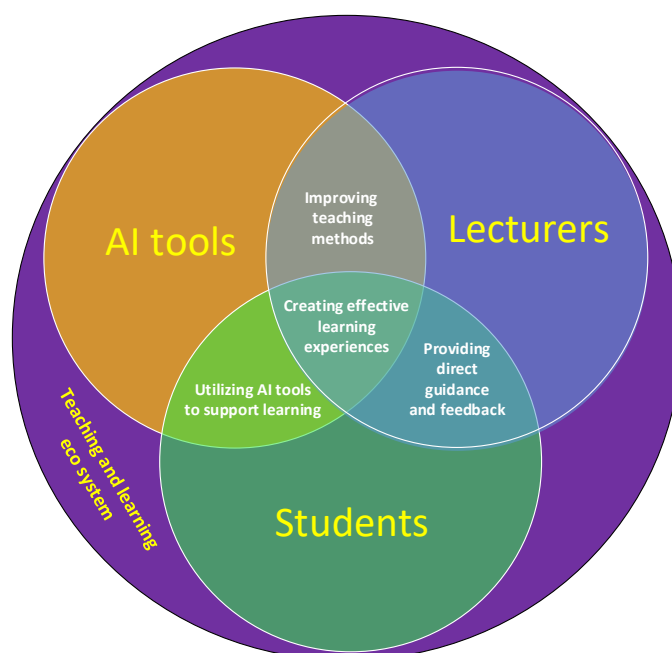
Slidesgo AI, Photoshop AI, Gemini, Copilot, Perplexity, and Gamma.app, which were used for a range of teaching and research activities. Among the reported application areas, lesson planning and material development were the most frequently identified, accounting for 34.5% (29/84), including material synthesis, syllabus drafting, and teaching-content preparation. Student assessment accounted for 8.3% (7/84), mainly involving quiz creation, grading support, and error checking. Personalized learning support accounted for 3.6% (3/84), while research-related applications accounted for 2.4% (2/84).

From a technical perspective, AI facilitates data analysis, content personalization, and the automation of assessment processes, enabling educators to optimize their teaching methods and make efficient use of their time. For students, AI creates flexible and adaptive learning environments, tailoring content to their individual needs, allowing quick access to relevant information, and offering personalized learning recommendations. These features promote self-directed learning and better management of individual learning progress. Simultaneously, educators retain a critical role in guiding, providing feedback, and adjusting students' learning trajectories. With AI-generated analytics, teachers can identify strengths and weaknesses in individual learners, proposing tailored strategies while maintaining a human-centered approach. This collaboration between AI and educators enhances knowledge transfer efficiency and fosters an educational environment that emphasizes critical thinking and social skills development.

Thus, the triadic relationship between AI, educators, and students contributes to a comprehensive and sustainable educational experience (see Figure 1). AI functions not only as a supporting tool but also as a driver of innovation in teaching and learning methods, aiming toward a modern educational ecosystem where quality and personalization are central.

Figure 1.

The Relationship between AI Tools, Students, and Lecturers



In this evolving educational context, the integration of AI is becoming indispensable. Augmented learning management systems (LMS) equipped with virtual tutors offer learners personalized and flexible access to knowledge. At the same time, AI-driven tools automate repetitive tasks for educators—from defining learning outcomes and constructing lesson plans

to designing rubrics and compiling course syllabi—enabling teachers to dedicate more time to direct student support. Blended learning models have proven particularly effective in this context, as they integrate virtual tutors and interactive materials within traditional teaching frameworks. Additionally, technologies such as Text-to-Speech, Text-to-Video, and Text-to-Simulation Video provide educators with intuitive and rapid digital content creation tools, thereby enhancing multimedia learning experiences. The synergistic combination of traditional teaching methods with AI platforms promises not only improved learning efficiency but also expanded professional development opportunities for both educators and students in the digital age. AI usage among lecturers increased significantly in the past three years.

In this study, we propose a suite of AI tools that align with established pedagogical strategies, as detailed in Table 3. We selected these tools to support and enhance various teaching approaches, ensuring that technology integration is effective and responsive to the needs of modern educational environments.

Table 3**Proposed AI Tools and Their Pedagogical Applications**

Pedagogical Strategy	AI platform	Function
virtual tutor	Poe	Poe AI is an intelligent chatbot platform developed by Quora that enables users to create and customize AI chatbots easily without any programming experience. Additionally, the responses generated by these chatbots can be tailored based on the knowledge and information provided by the user, ensuring more personalized and relevant interactions
	DIFY	Dify is an open-source platform that enables users to create and customize AI chatbots through an intuitive interface, without the need for programming experience. It supports integration with advanced AI models such as GPT-4, Mistral, and Llama3, facilitating the development of chatbots capable of providing effective learning support. Additionally, Dify allows embedding chatbots into Learning Management Systems (LMS) or websites via iframe, making it easy for educators to deploy them on existing educational platforms.
	Coze	
Data Organization	NotebookLM	NotebookLM is an AI-powered tool developed by Google that assists users in managing, organizing, and analyzing information from various data sources. Users can upload documents, such as PDFs and text files, and NotebookLM will analyze and provide summaries, answer questions related to the content, and explain complex concepts. Notably, this tool enables educators to create exam questions based on their own materials, supporting effective lesson planning and teaching material development.
Blended learning	Chatgpt Gemini Claude	AI tools that assist educators in creating blended learning lesson plans through prompt-based methods. These tools generate teaching content, suggest online/offline learning activities, and design assessments, thereby streamlining the lesson planning process.
Active learning	QuizzAI Kahoot AI	Interactive quiz and game creation tools. Kahoot! Enables educators to develop multiple-choice questions or gamified learning sessions. Incorporating these tools boosts student engagement and fosters a lively, effective learning

Gamification	Gamizign	environment. An AI-driven gamification platform that allows instructors to design eLearning games without coding skills. It offers automated assessments with detailed analytics, helping educators identify learning gaps and adapt course content for improved outcomes.
Collaboration, teamwork	Miro	Miro facilitates effective collaboration by providing an online whiteboard where team members can brainstorm, plan, and manage projects in real time. With Miro AI, the platform automatically clusters ideas, summarizes content, and suggests solutions, optimizing teamwork processes. Miro also integrates with various tools like Slack, Jira, and Microsoft Teams, ensuring seamless information synchronization and enhancing remote work efficiency.

In addition, generative AI platforms such as ChatGPT, Claude, and Gemini require instructors to construct clear and well-structured prompts in order for AI systems to perform tasks effectively. This study proposes a prompt structure formulated as:

Role + Context + Task + Reference Materials + Format + Constraints (1).

This structure helps ensure that AI-generated outputs are pedagogically appropriate and aligned with the specific requirements of teaching and learning activities. Based on Equation (1), this study develops a lesson plan for a 60-minute synchronous online session on the topic of Gamification in Online Learning, designed for third-year university students majoring in Instructional Technology. The lesson plan is grounded in Self-Determination Theory and Bloom's Taxonomy, and incorporates active learning strategies to enhance student engagement. The lesson was developed using ChatGPT and is presented in Table 4.

Table 4

Lesson Plan Developed Using ChatGPT

Learning Objectives (Bloom's Taxonomy)	Instructional Strategies	Active Learning Activities	Assessment Methods
Define gamification and distinguish it from game-based learning (Remembering, Understanding)	Mini-lecture	Short lecture with examples; Think–Pair–Share via chat or breakout rooms	Online poll/quiz to check basic understanding
Explain how gamification enhances motivation based on Self-Determination Theory (Understanding, Applying)	Concept mapping & discussion	Group concept mapping (Miro/Padlet) linking SDT principles to gamification elements	Group presentation with instructor feedback
Analyze the impact of gamification elements on student engagement (Analyzing)	Case study analysis	Small-group analysis of gamified e-learning cases using Padlet or discussion boards	Peer feedback on case analyses
Design a simple gamified activity for online learning (Creating)	Collaborative design	Group design of a basic gamification strategy and brief presentation	Instructor and peer feedback
Reflect on the use of gamification in future teaching practice (Evaluating)	Reflective discussion	Individual written reflection in shared document or forum	Exit ticket (one-minute reflection)

By adhering to this comprehensive equation, educators can construct precise and effective AI prompts that enhance the quality and relevance of AI-generated content. This structured

approach not only aligns with pedagogical objectives but also supports the creation of consistent, high-quality instructional materials.

Key Challenges and Findings

Integrating artificial intelligence (AI) into educational practices offers substantial benefits; however, it also presents several critical challenges. Our analysis, based on educator feedback, delineates a range of technical and pedagogical concerns, as detailed in Table 5.

Table 5

Key Challenges in AI Integration in Education

Challenge	Percentage of Lecturer Concerns (%)
Replacement of lecturers' roles	3.3
Information security	6.7
Student over-reliance on AI	6.7
Inaccurate information	5.0
Irresponsible AI usage	1.7

Table 5 presents the key challenges in AI integration as identified by educators, along with the corresponding percentages of lecturer concerns. Although AI offers many benefits in teaching and learning, instructors still express certain concerns about its application. Most notably, concerns about data security and the risk of students becoming overly reliant on AI (6.7%) stem from the potential privacy risks associated with processing large amounts of personal and academic data, as well as the potential reduction in independent thinking skills as learners become lazy and rely on AI-generated results. Additionally, 5.0% of instructors worry that AI could generate inaccurate or outdated information, impacting the quality of learning materials and the learning process. Other concerns include the possibility of AI diminishing the instructor's role as a mentor and advisor (3.3%) or being used irresponsibly, leading to ethical issues in academics (1.7%). These findings suggest that integrating AI into education requires appropriate management policies, content verification mechanisms, and responsible usage guidelines to maximize the benefits of AI while maintaining the central role of instructors and learners.

In addition to the challenges, our study also identified essential skills and policy measures to facilitate effective AI integration. Table 6 summarizes the key skills deemed necessary by educators, while Table 6 presents recommended policy interventions.

Table 6

Essential Skills for AI Integration

Suggested Skill	Percentage (%)
Technological proficiency	14.7
Pedagogical competency	14.7
Logical reasoning	11.8
Prompt engineering skills	11.8
Information retrieval skills	5.9
Data management skills	2.9

Table 7

Recommended Policy Measures for AI Adoption

Policy Recommendation	Percentage (%)
AI literacy and training programs	30.6
Data security and privacy protection	19.4
Academic integrity and anti-cheating strategies	11.1
Transparency and ethical guidelines	5.6

The empirical evidence underscores that while AI integration holds transformative potential, addressing these challenges is paramount. Comprehensive policy measures, such as robust AI literacy and training programs and enhanced data security protocols, are essential to mitigate risks and maximize AI's educational benefits. By fostering targeted skill development and enforcing ethical guidelines, educational institutions can leverage AI as a transformative tool to elevate teaching and learning outcomes while maintaining academic integrity and safeguarding data privacy.

Benefits of AI Integration

Research findings show that integrating AI into education offers significant benefits for both instructors and learners. AI helps instructors improve the efficiency of lesson planning, learning materials design, and course syllabi, with 34.5% of instructors citing this as their most prominent application. At the same time, technologies such as Text-to-Speech and video simulations create interactive, multimedia learning environments suited to diverse learning styles. AI also supports research through literature reviews, data analysis, and scientific report writing, helping users focus more on critical thinking and creativity. Furthermore, automating repetitive tasks saves instructors time, enhances mentoring and guidance, and improves the curriculum. These results show that AI has enormous potential to improve efficiency, personalize learning experiences, and drive educational innovation, contributing to a flexible, adaptable, learner-centered learning ecosystem in the digital age.

Practical Framework for Teaching

To optimize AI application, the Connections Circle model analyzes relationships among faculty, AI tools, AI application fields, concerns, and potential solutions. Based on this model, two critical leverage points that can significantly impact the entire system have been identified: enhancing faculty competency and establishing security policies and risk control mechanisms (See Figure 3).

First, faculty competency in AI usage plays a decisive role in optimizing this technology. Faculty members are not only direct users of AI but also guide students on how to approach AI responsibly. In this study, although 71.4% of faculty members have integrated AI into teaching, their proficiency and risk control capabilities remain limited. This highlights an urgent need for comprehensive training programs to help faculty effectively utilize AI while avoiding over-reliance on the technology. Key solutions include offering specialized AI courses, building a community for faculty to share experiences, and embedding AI into curricula to build faculty competency in the digital era.

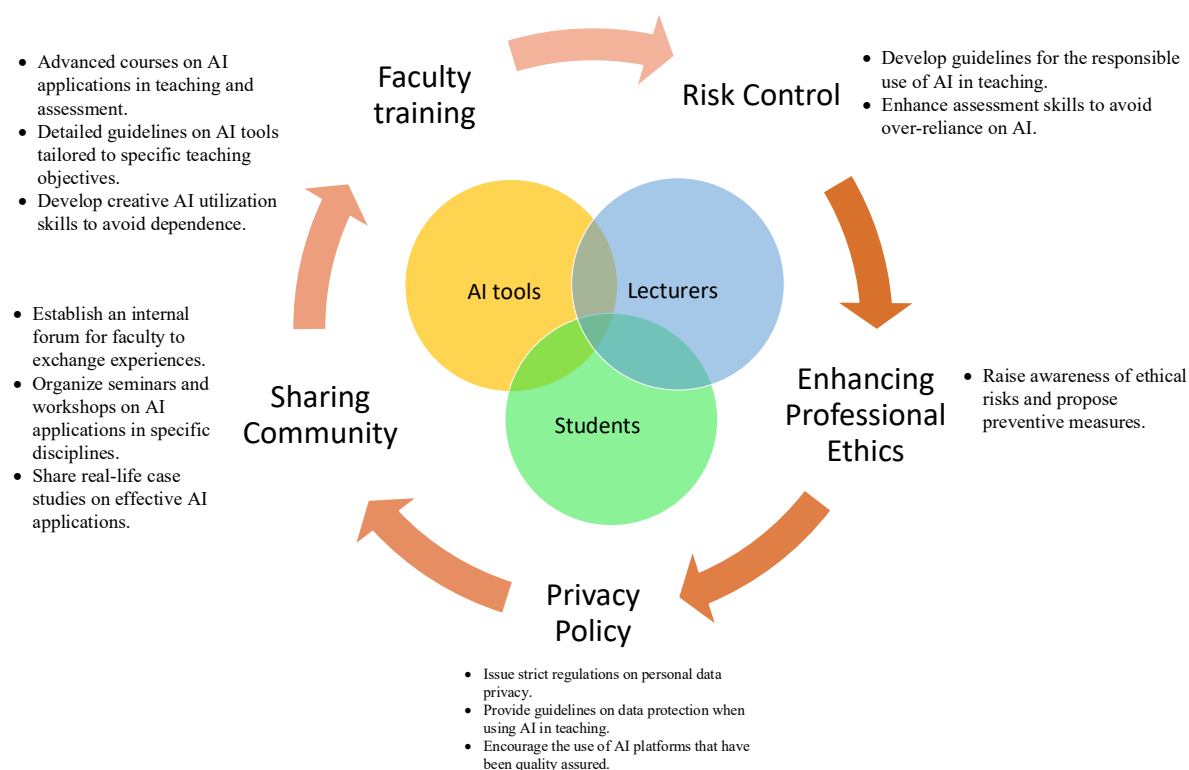
Second, security policies and risk control are crucial factors in ensuring AI is used safely and ethically in education. One of the biggest concerns today is the risk of personal data leaks and the potential misuse of AI for academic dishonesty. Approximately 6.7% of faculty members expressed concerns about data security, while a similar percentage worried about students' excessive dependence on AI. To address this issue, it is essential to establish robust data

protection policies, provide guidelines for responsible AI use for both faculty and students, and implement ethical regulations for AI integration in teaching and research. Additionally, developing AI risk control tools, such as AI monitoring systems in education, is a critical solution to prevent AI misuse.

In summary, AI in education should be implemented on two fundamental pillars: faculty competency development and the establishment of security and risk-control frameworks. If faculty members receive structured training and develop in-depth knowledge of AI, they will be able to leverage this technology optimally and effectively. At the same time, clear security and ethical policies will ensure AI serves as a powerful teaching assistant rather than a risk factor. Only through a strong combination of human capacity development and technology control can AI fully realize its potential in education and deliver sustainable benefits. Based on these analyses, Figure 2 presents the AI Integration Framework for Teaching Excellence.

Figure 2.

AI Integration Framework for Teaching



The AI Integration Framework for Teaching Excellence illustrates the interaction between three core components in applying artificial intelligence (AI) in education: AI tools, lectures, and students, along with four supporting factors that ensure effectiveness and safety. Faculty Training plays a crucial role in providing advanced courses on AI applications, developing detailed guidelines to help faculty members use AI tools in alignment with teaching objectives, and encouraging innovative pedagogical approaches to prevent AI misuse.

Risk Control focuses on developing guidelines for responsible AI use, enhancing evaluation skills to mitigate over-reliance on AI in education, and ensuring AI is applied as a supportive tool rather than a substitute for critical thinking and problem-solving. Enhancing Professional Ethics emphasizes raising awareness of ethical issues related to AI, integrating preventive measures to promote responsible AI use, and fostering an ethical teaching environment that

aligns with academic integrity. The Privacy Policy protects personal data, provides security guidelines for AI use in teaching, and encourages the use of verified AI platforms that meet quality and ethical standards. Sharing Community fosters internal faculty discussion forums, organizes specialized AI workshops in education, and promotes case-based knowledge sharing to illustrate AI's effectiveness in teaching and learning. This framework ensures that AI integration in education is carried out responsibly, optimizing the teaching process while maintaining professional ethics, data security, and sustainable development within the academic community.

Discussion

Integrating artificial intelligence (AI) into higher education has become a transformative force, changing pedagogical methods, teaching strategies, and learner engagement. This research aligns with numerous international studies, demonstrating that AI-assisted teaching methods facilitate the development of learning materials and personalize learning, while posing ethical and operational challenges (Kakhkharova & Tuychieva, 2024). In this discussion, we compare the findings with international work to clarify AI's role in higher education and propose practical recommendations for responsible AI deployment.

One key finding is AI's prominent role in supporting teaching activities. Most faculty members surveyed (71.4%) reported using AI for lesson planning and material compilation. This result aligns with Bearman and Ajjawi (2023), which suggests that AI-assisted pedagogical methods have created new teaching models by automating daily tasks, allowing instructors to focus more on developing critical thinking and enhancing interaction with learners. However, both the research and the results of Southworth et al. (2023) emphasize that effective AI deployment requires instructors to possess AI literacy to use the technology optimally and ethically. This highlights the need for instructor professional development, a crucial component of the proposed "AI Integration Framework for Enhancing Teaching Quality".

Despite its many benefits, the application of AI in higher education also faces numerous challenges. Many faculty members raised concerns about data privacy, students' over-reliance on AI, and the risk of impaired critical thinking skills. These findings can be considered alongside Bayaga (2025), who examined AI adoption in higher education using the UTAUT and TOE frameworks and PLS-SEM. Bayaga found that performance expectancy and effort expectancy significantly influenced attitudes towards AI, which in turn significantly influenced behavioral intention to use AI. The study also highlighted how organizational context shapes attitudes toward AI. These findings underscore the importance of individual perceptions and organizational conditions in AI adoption. Furthermore, Zawacki-Richter et al.'s (2019) research confirms that while AI can personalize learning pathways, its deployment needs to be accompanied by appropriate policies and regulations to prevent academic fraud and ensure responsible use of AI.

Current discussions on AI in education also highlight how this technology affects the relationship between instructors and students. Nikolopoulou (2024) argues that AI should be seen as a tool to support instructors rather than a replacement for traditional pedagogical interactions. This perspective aligns with our findings, which position AI as a collaborative tool to enhance teaching effectiveness rather than replace instructors. To achieve this balance, educational institutions need to develop clear guidelines and ethical frameworks to regulate the scope and manner of AI use in teaching.

From the above analysis, the research indicates that the integration of AI in higher education

needs to be done responsibly and strategically. Based on a comparison with international studies, we believe that successful AI application requires a step-by-step approach, including developing faculty capacity, raising student awareness, and strengthening data security measures. In the future, more longitudinal studies are needed to assess the long-term impact of AI on student learning outcomes and innovation in pedagogy. As AI continues to develop, educational institutions need to maintain adaptability, ensuring that technology serves as a tool to enhance the quality of teaching rather than undermining the core values of education.

Conclusion

This study highlights the transformative impact of artificial intelligence (AI) on higher education, demonstrating its potential to enhance teaching effectiveness and foster personalized learning experiences. The findings are consistent with international research, which also indicates that AI applications can significantly improve teaching performance, while also posing challenges related to ethics, data security, and over-reliance on technology.

One proposal from the study is the development of an “AI Integration Framework for Teaching,” providing a systematic approach to AI deployment in higher education. This framework focuses on five core components: faculty capacity building and development, data security policy development, risk management, promotion of professional ethics, and development of an AI learning community. By integrating these components, educational institutions can effectively leverage the benefits of AI while minimizing risks related to academic integrity, data security, and responsible AI use.

The research also shows that formal faculty training is a prerequisite for equipping them with the skills needed to integrate AI effectively into teaching. Furthermore, educational institutions need to develop and implement comprehensive data protection policies to address information security concerns. Promote ethical AI use through clear guidelines, ensuring AI serves as a support tool rather than replacing instructors. At the same time, building a learning community and sharing experiences on AI between faculty and students will help improve the effectiveness of AI applications in education, foster innovation, and enhance the quality of training in the context of current digital transformation.

Compliance with Ethical Standards

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Biodata

Dr. Le Phuong Truong is a lecturer in the Faculty of Mechatronics and Electronics at Lac Hong University (LHU) in Bien Hoa, Vietnam. He earned his B.Eng., M.Eng., and Ph.D. degrees in Electrical Engineering from Lac Hong University (Vietnam), Southern Taiwan University of Science and Technology, and Da Yeh University (Taiwan) in 2005, 2010, and 2016, respectively. He currently serves as Head of the Education Group at Lac Hong University. His research interests include digital pedagogy, AI, and renewable energy. For inquiries, he can be reached via email at lephuongtruong@lhu.edu.vn.

Dr. Nguyen Huu Nghi is a PhD holder in Cultural Studies, awarded in 2020 by the University of Social Sciences and Humanities, Vietnam National University Ho Chi Minh City. His research focuses on culture, tourism, and the application of artificial intelligence in education, and his scholarly work aims to integrate cultural and social values with sustainable tourism development and technology-based educational innovation. He currently serves as a lecturer in the Faculty of Oriental Studies at Lac Hong University.

Le Duc Thinh, Dean of the Faculty of English Language at Lac Hong University, obtained his bachelor's degree in English Pedagogy from Quy Nhon University and earned his master's

degree in TESOL from the University of Social Sciences and Humanities - Ho Chi Minh City National University. His research interests include English language teaching, applying AI to improve teaching quality, and linguistic studies such as discourse analysis, genre analysis, cognitive linguistics, pragmatics, language and culture, functional grammar, and English-Vietnamese comparative linguistics.