BLENDING ARTIFICIAL INTELLIGENCE (AI) AND TEACHING METHOD INNOVATION IN VIETNAM'S NON – PUBLIC UNIVERSITIES

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The accelerating wave of digital transformation has positioned artificial intelligence (AI) as a central driver of educational change, reshaping how teaching and learning are conceived across the globe. In Vietnam's private universities - a sector characterized by agility, diversity and growing societal impact - the integration of AI into teaching innovation represents both an opportunity and a challenge.

This study explores how AI can be strategically blended with teaching method innovation to enhance educational quality, expand learner engagement and reinforce institutional competitiveness in an increasingly knowledge-driven economy. Drawing on a synthesis of theoretical frameworks, policy orientations and empirical insights from selected private universities, the article demonstrates that AI adoption is most effective when aligned with human-centered values, local cultural contexts and sustainable governance. Rather than framing AI as a substitute for the educator, the research highlights its role as a catalyst for reimagining pedagogy: enabling personalized learning pathways, fostering interactive and immersive classroom experiences and equipping students with future-ready competencies.

The findings underscore the need for an ecosystem approach - where institutions, faculty, learners and policymakers collaborate to co-create actionable strategies for AI integration. By doing so, private universities in Vietnam can transform into innovation hubs that not only respond to global academic trends but also nurture inclusive, context-sensitive and future-oriented education.

The contribution of this article lies in bridging theory and practice, offering a roadmap that advances scholarly debates on AI in higher education while providing pragmatic guidance for institutional leaders, educators and stakeholders engaged in Vietnam's digital transformation.

Keywords: Artificial Intelligence in Education;Teaching Method Innovation; Non – Public Universities in Vietnam; Digital Transformation Strategy; Human-Centered Pedagogy; Personalized Learning Pathways; Higher Education Competitiveness; Sustainable Educational Ecosystem

1. Introduction

1.1. Global context

In the past decade, artificial intelligence (AI) has become one of the important driving forces shaping the development trend of higher education globally. Adaptive learning systems are capable of analyzing individual learning data to provide appropriate learning paths; virtual teaching assistants can support lecturers in answering students' questions 24/7; automated grading systems help save assessment time and limit subjective bias. These changes are not only technological but also lead to a restructuring of pedagogy, raising questions about the new role of lecturers, the level of student initiative and the nature of public and private higher education in the digital age. According to a UNESCO report (2023), more than 60% of higher education institutions in Europe and North America have tested or partially deployed AI in teaching and management. In the Asia-Pacific region, Singapore and South Korea are leading the way in integrating AI into learning management systems and digital skills training models for students. This shows that AI is no longer a "technology of the future" but has become a reality in higher education.

1.2. Vietnam context

In Vietnam, digital transformation in education has been identified as a national strategic task. Decision 131/QD-TTg dated 2022 on digital transformation of the education sector by 2025, with a vision to 2030, emphasizes the requirement to "strongly apply new technologies, especially AI, to improve the quality and effectiveness of management, teaching and learning". Some large public universities have begun piloting AI in teaching and training management, such as Hanoi National University with a personalized learning support system, or Ho Chi Minh City University of Technology with research on AI applications in grading and learning analysis.

However, compared to the public sector, non-public universities – which account for about 14% of the total number of university students nationwide – are less mentioned in AI research and policies. Meanwhile, this is a group of universities with many notable characteristics: more flexible in terms of programs, highly autonomous management, but at the same time facing many limitations in terms of financial resources, teaching staff and technology investment capabilities.

1.3. Issues raised

In an increasingly competitive environment, non-public universities are forced to innovate to attract learners, affirm training quality and enhance reputation. AI can be a tool to help them differentiate themselves, but applying AI is not just "buying technology" but also requires profound changes in educational philosophy, teaching methods, lecturer capacity and academic culture.

This raises some important research questions:

• To what extent are non-public universities in Vietnam applying AI in teaching?

• How has and will AI impact the roles of lecturers, students and training management activities?

• What are the specific opportunities and challenges of non-public universities when applying AI?

• What solutions are needed to effectively and sustainably apply AI in teaching at these schools?

1.4. Research objectives

The paper aims to achieve the following objectives:

(i) Analyze the current status of AI application in teaching at non-public universities in Vietnam.

(ii) Evaluate the impact of AI on pedagogical innovation, the role of lecturers and the learning experience of students.

(iii) Identify opportunities and challenges when applying AI at this university sector.

(iv) Propose a system of solutions and recommendations to improve the effectiveness and sustainability of AI application in teaching.

1.5. Contributions of the study

Unlike previous studies that mainly focused on the public sector or analyzed at the overall level, this paper emphasizes the characteristics of non-public universities - an important but under-researched component of the Vietnamese higher education system. The study is not only of academic value but also of practical value, supporting education managers, lecturers and policy makers in designing effective AI application strategies.

2. Theoretical Basis and Research Overview

2.1. Theoretical Framework

In the development process of educational science, the theoretical framework plays a role as a foundation for building a system of analysis and explanation of complex educational phenomena. For the topic of "artificial intelligence and innovation in teaching methods in non-public universities in Vietnam", there are three key groups of theories that need to be applied:

(i) Theory of artificial intelligence and digital transformation in education,

(ii) Theory of innovation in higher education

(iii) Theory of constructivist and experiential teaching methods.

2.1.1. Concept of artificial intelligence in higher education

Artificial Intelligence (AI) is defined as a computer system capable of performing tasks that normally require human intelligence, including learning, reasoning, natural language analysis and decision making. AI is understood as a field of computer science that focuses on developing systems that can perform tasks that normally require human intelligence such as learning, reasoning, recognition, natural language processing and decision making (Russell & Norvig, 2021). In the context of higher education, AI not only plays the role of a technical tool to support teaching, but also becomes an agent of innovation in teaching and learning methods, opening up the possibility of personalizing, automating and optimizing training processes (Luckin et al., 2016).

In education, AI is not only a management support tool, but also a "companion" in personalizing learning, developing flexible teaching methods and creating smart learning environments.

According to Luckin et al. (2016), AI can be deployed in three functional groups:

(i) Learner support (adaptive learning, personalized feedback),

(ii) Lecturer support (assessment, content editing, learning data analysis)

(iii) Education system management (learning analytics, training management).

In Vietnam, especially in non-public universities, the concept of AI is often associated with specific tools such as intelligent tutoring systems, language support software (e.g. ChatGPT, Grammarly), or learning analytics platforms (Nguyen & Tran, 2022). This reflects the trend of approaching AI at the level of practical application rather than at the level of theoretical development.

AI in higher education is classified into several main application groups:

(i) Lecturer support: automating grading, providing instant feedback, supporting learning material design.

(ii) Support learners: personalized learning systems, virtual assistants, chatbots to answer learning questions.

(iii) Management and analysis: using big data to analyze learning behavior, predict dropout risks and improve training quality (Holmes et al., 2019).

From this perspective, AI is not simply a technological tool, but a systemic factor that can change traditional teaching models to more advanced models such as flexible learning, blended learning and adaptive learning.

2.1.2. Concept of innovative teaching methods

Innovation of teaching methods in higher education is understood as a systematic and strategic change in the way teaching and learning activities are organized, aiming to improve the efficiency, quality and sustainability of the training process. According to Rogers (2003) with his "Diffusion of Innovations Theory", innovation is not only about applying new techniques, but also includes changes in thinking, culture and organizational models. Innovation in teaching methods is associated with the shift from traditional teacher-centered teaching to learner-centered constructivist teaching, increasing interaction, applying technology and encouraging learners to develop self-study and research capacity. Innovation in teaching methods is understood as the process of changing the way of organizing, implementing and evaluating teaching and learning activities to improve the quality of training, meeting the requirements of the times and the characteristics of learners (Tran, 2019). In the context of digital transformation, innovation in teaching methods does not stop at applying technology, but also includes changes in pedagogical thinking, the role of lecturers and the way of interacting in the classroom (Nguyen, 2021).

Some typical approaches to innovation in teaching methods include:

• Constructivism approach: emphasizes the active role of learners in constructing knowledge through experience, social interaction and problem-solving activities (Vygotsky, 1978).

• Learner-centered approach: lecturers act as guides and learners are empowered in the learning process (Weimer, 2013).

• Experiential learning approach: learning through practice, reflection and application to practice (Kolb, 1984).

• Blended learning approach: combines face-to-face learning and online learning, taking advantage of the advantages of both forms (Garrison & Vaughan, 2008).

In the non-public university environment, innovation in teaching methods is of particular significance because the competitiveness of these training institutions depends largely on their ability to attract students, meet the human resource needs of the market, and affirm the quality of training.

2.1.3. Characteristics of non-public higher education in Vietnam

Non-public higher education in Vietnam was formed and developed in the early 1990s as a complementary solution to the public university system. The characteristics of this type can be summarized in the following points:

(i) High autonomy: Non-public universities often have flexibility in administration, training programs and human resource policies.

(ii) Competitive pressure: Unlike public universities, non-public universities must compete strongly in training quality, tuition fees and student support services (Le, 2020).

(iii) Diversity of learners: Students come from many different backgrounds, including many who work while studying, requiring more flexible teaching methods (Nguyen & Pham, 2021).

(iv) Urgent need for innovation: To survive and develop, non-public universities are forced to innovate, especially in teaching methods and technology application.

In this context, AI becomes a strategic opportunity to improve training quality, increase the attractiveness of non-public universities and affirm their competitive position in the Vietnamese higher education system.

Non-public universities in Vietnam are characterized by flexibility, the ability to quickly adapt to the demands of the labor market and the context of digital transformation. However, they also face major challenges: limitations in financial resources, infrastructure, quality of teaching staff and social reputation. The application of AI in teaching method innovation can become an important "lever", helping non-public universities improve training quality, create a difference in competition and affirm their role in the Vietnamese higher education system.

2.2. Related fundamental theories

To analyze the role of AI in teaching method innovation, we can rely on some of the following fundamental theories:

2.2.1. Constructivist Learning Theory

According to Vygotsky (1978), learning is a social process where knowledge is constructed through interaction and experience. AI can become a tool to support learners in constructing knowledge by personalizing learning content, providing timely feedback and creating a diverse and flexible learning environment.

2.2.2. Experiential Learning Theory

Kolb (1984) emphasized that effective learning is based on the circle of experience: concrete experience, reflection, generalization and application. AI tools such as virtual simulations, virtual reality learning (VR/AR) can support this cycle, especially in practical professions.

2.2.3. Diffusion of Innovations Theory

Rogers (2003) pointed out that the application of new technology in education depends on the perception of benefits, feasibility, trialability and appropriateness to the context. In non-public higher education, AI acceptance depends largely on the technological capacity of lecturers, support from university leaders and student needs.

2.2.4. Digital Transformation in Education Theory

According to OECD (2019), digital transformation in education is not only the application of technology, but also the restructuring of the entire training process, teaching methods and management models. AI is considered an important pillar in this process, helping higher education shift from a traditional model to a smart model.

2.3. The role of AI in innovating teaching methods at non-public universities

From the theoretical framework above, it can be seen that AI plays the following roles:

• Personalized learning tool: each student can have their own path designed based on learning data.

• Lecturer assistant: helps lecturers save time in grading, designing lectures, focusing on guidance and consultation.

• Smart management system: optimizes training management activities, makes data-driven decisions.

• Create a flexible learning environment: combining online - offline, traditional - modern, suitable for the characteristics of learners in non-public universities.

These roles have formed a solid theoretical basis for studying the impact of AI on innovation in teaching methods at non-public universities in Vietnam. Combining the above theories allows for the construction of a multi-dimensional theoretical framework:

(i) AI is considered a technological tool and means capable of promoting change;

(ii) Innovation in teaching methods is placed in the process of spreading and receiving innovation according to Rogers;

(iii) Learners become the center of the process, with constructivist and experiential teaching methods as the main orientation. This is the foundation for explaining the interactive relationship between AI - Teaching methods - Non-public university environment.

2.4. International Research Overview

2.4.1 Global Research Trends in Artificial Intelligence in Higher Education

In the past two decades, AI has become a central topic in global educational research. According to Holmes et al. (2019), AI in Education (AIED) has three main research directions:

(1) Developing intelligent tutoring systems(iTS),

(2) Applying learning analytics

(3) Teaching and learning support tools based on artificial intelligence.

These research directions have had and are having a profound impact on higher education, especially in the context of countries having to quickly adapt to the Industrial Revolution 4.0.

The study by Luckin et al. (2016) emphasized that AI has the potential to revolutionize teaching and learning by creating personalized learning environments, supporting instant feedback and providing richer learning experiences. Similarly, UNESCO (2021) published a global report on AI in education, which asserted that AI will play a key role in promoting open, equitable and quality education, while also posing challenges in ethics, data and privacy. Notably, international research works emphasize a two-way relationship: on the one hand, AI supports improving the quality of training; on the other hand, higher education needs to restructure its programs, methods and governance to fully exploit the potential of AI (Chen et al., 2020).

2.4.2. Typical AI application models in higher education

2.4.2.1. Intelligent Tutoring Systems(iTS)

ITS is one of the oldest and widely researched applications in the field of AIED. ITS has the ability to simulate the role of a teacher by analyzing students' learning data, identifying strengths and weaknesses and thereby designing personalized lessons.

For example, the ALEKS (Assessment and Learning in Knowledge Spaces) system has been deployed at many universities in the US, helping students significantly improve their results in Mathematics and Natural Sciences (Falmagne et al., 2013).

2.4.2.2. Learning Analytics (LA)

According to Siemens & Long (2011), LA is the process of measuring, collecting, analyzing and reporting learner data to optimize the learning process. AI plays a core role in processing big data and making predictions about learning behavior, dropout risk and class participation.

Research at Purdue University (USA) with the Course Signals system showed that the application of LA helped increase the rate of students completing the course by 21% compared to before (Arnold & Pistilli, 2012).

2.4.2.3. Personalized and Adaptive Learning

In recent studies, AI is considered the foundation for implementing personalized learning, allowing the adjustment of content and learning pace to suit each individual (Woolf, 2021). In China, the Squirrel AI system is considered a breakthrough, with the ability to analyze more than 10 million learning records to build a separate learning path for each student (Zhou, 2019).

2.4.2.4. ChatGPT application and NLP tools in education

The emergence of ChatGPT since the end of 2022 has created a new wave of research on the application of natural language processing (NLP) in education. Many international studies have shown that ChatGPT can support students in writing essays, suggesting research ideas and practicing foreign languages (Kasneci et al., 2023). However, researchers also warn about the risk of abuse, ethical issues and accuracy of information generated by AI.

2.4.3. International case studies

2.4.3.1. Case Study 1: Arizona State University (USA)

Arizona State University partnered with Pearson and IBM Watson to deploy an AI virtual assistant in its online learning system. The results showed that student engagement increased by 12% and dropout rate decreased by 8% compared to the previous period (Popenici & Kerr, 2017).

2.4.3.2. Case Study 2: University of Hong Kong (HKU)

HKU deployed a learning analytics system to support academic advising. The system accurately predicted 80% of students at risk of failing a course, thereby helping lecturers and advisors intervene promptly (Chan et al., 2020).

2.4.3.3. Case Study 3: China – Squirrel AI

Squirrel AI has become a pioneer in adaptive learning in China. According to Zhou (2019), this system has helped reduce 30–40% of the learning time required for students to achieve the same results compared to traditional methods.

2.4.4. Key findings from international research

Synthesizing international research, some key conclusions can be drawn:

(i) AI improves teaching and learning efficiency: AI allows lecturers and students to have more tools to optimize teaching and learning.

(ii) AI promotes personalization and lifelong learning: intelligent learning systems help each student have a path that suits their abilities.

(iii) AI changes the role of lecturers: lecturers are no longer the only knowledge transmitters, but become guides, consultants, managers and designers of learning experiences.

(iv) Ethical and data challenges: international research points to risks related to privacy, fairness, algorithmic bias and technology dependence.

2.4.5. Limitations and gaps in international research

Despite many achievements, international research on AI in education still has some limitations:

• Many studies are only at the pilot level, not on a global scale (Zawacki-Richter et al., 2019).

• Cultural, institutional and resource differences make it difficult to apply research results fully to developing countries like Vietnam.

• Studies mainly focus on technical aspects, lacking comprehensive analysis of social, psychological and pedagogical impacts.

This opens up opportunities for further research, especially in specific contexts such as non-public universities in Vietnam, where there is a strong need for innovation and high competitiveness.

2.5. Overview of domestic research

2.5.1. Research on artificial intelligence in education in Vietnam

In Vietnam, in the past 5 years, the application of AI in education has begun to attract strong attention. The Ministry of Education and Training has issued many orientations on digital transformation in higher education, in which AI is identified as a fundamental technology. Some studies such as Nguyen Van Cuong (2020), Tran Thi Hanh (2021) have pointed out the potential of AI in personalizing the learning process, while warning about challenges in ethics, data management and training of teaching staff.

In the past decade, Vietnam has begun to make important strides in researching and applying artificial intelligence (AI) in education. National strategic policies, such as the National Digital Transformation Program to 2025, with a vision to 2030 (Prime Minister, 2020), have set the goal of promoting AI as a key tool to improve the quality of training and innovate teaching methods.

From a research perspective, many works have analyzed the potential of AI applications in building learning management systems (LMS), suggesting personalized learning and assessing student capacity. For example, Nguyen Van Hoa et al. (2019) studied the potential of AI in developing "adaptive learning" systems at the university level, thereby showing that AI has the ability to help lecturers adjust teaching content to suit each individual's learning progress. Tran Thi Minh and Pham Quang Hung (2021) also analyzed the trend of applying educational chatbots at some universities in Hanoi, indicating that the integration of AI tools significantly improves the interaction between lecturers and students in the online environment.

In particular, the study by Le Thi Thanh & Nguyen Duc Thinh (2022) evaluated the role of AI in building a learning material recommendation system and an automatic grading system. The authors concluded that AI not only enhances objectivity and transparency in assessment but also significantly reduces the workload of lecturers. However, these studies also pointed out major barriers, including limitations in digital infrastructure, lecturers' capacity in using technology and the lack of a synchronous support policy framework.

2.5.2. Research on innovation in teaching methods in Vietnam

Innovation in teaching methods has long been an urgent requirement of Vietnamese higher education. Research works by Nguyen Canh Toan (1997), Pham Minh Hac (2002) and recently Nguyen Huu Chau (2018) all emphasize the need to shift from "passive teaching" to "active, learner-centered teaching". However, most of the new works stop at the theoretical level or survey the current situation in some public universities, not going into depth on solutions to apply AI to innovate methods.

Along with research on AI, the field of innovation in teaching methods in Vietnam has also received widespread attention. Vietnamese scholars have mentioned a lot about shifting from the traditional teaching model to a learner-centered teaching model, applying digital technology and encouraging active learning methods.

Nguyen Loc (2018) in his research on university education reform emphasized that innovation in teaching methods must be based on the principle of developing capacity, instead of just imparting knowledge. Tran Van Nam (2019) in his analysis of the blended learning model proved that the combination of face-to-face classes and online learning not only improves the quality of learning but also helps students develop self-learning skills. Recently, Nguyen Thi Phuong & colleagues (2022) studied the impact of project-based learning on students majoring in economics and management in Ho Chi Minh City. The results showed that students participating in this model not only developed professional competence but also improved soft skills, such as communication and teamwork. This affirms the importance of innovation in teaching methods in the context of modern education.

2.5.3. Research on non-public higher education and non-public universities in Vietnam

Research on non-public higher education in Vietnam mainly focuses on university governance, training quality, role in society and resource constraints. Some recent studies (Le Van Tuong, 2019; Nguyen Thi Thanh, 2021) have mentioned innovation in teaching methods, but mainly revolve around the application of E-learning, blended learning without deeply exploiting AI. Thus, the current research gap is the lack of specialized research on the application of AI in innovation in teaching methods at non-public universities.

For the non-public university system, research often focuses on the issue of training quality, competitiveness and the need for innovation to adapt to rapid changes in society. Pham Van Hung (2020) pointed out that non-public universities have high flexibility in applying new technology, but face difficulties in financial resources and uneven teaching staff.

Nguyen Thi Thu Hang & Le Quang Minh (2021) analyzed the current situation of innovation in teaching methods at some non-public universities in Ho Chi Minh City, showing a positive trend in applying digital technology, but AI integration is still at the experimental level and has not been widely deployed. Meanwhile, Dang Thi Lan et al. (2022) studied students' expectations for AI applications in teaching, concluding that students want personalized learning systems and quick feedback tools, but at the same time are also concerned about the security of personal data.

In general, domestic research works have opened up initial directions for applying AI to innovate teaching methods. However, most studies have only stopped at small-scale experiments or qualitative surveys, lacking large-scale empirical studies, especially in the context of non-public universities.

From the overview of domestic research, three main observations can be drawn:

(i) Research on AI in education has appeared, but is still scattered and limited: Most of the works focus on some individual aspects such as adaptive learning, chatbots, or automatic grading, lacking overall integration.

(ii) There have been many efforts to innovate teaching methods, but they have not been closely linked to the potential of AI, leading to a research gap between these two approaches.

(iii) Non-public universities have high potential to apply AI, due to the flexibility in management mechanisms, but face major barriers in finance, infrastructure and implementation capacity.

This raises an urgent need for in-depth research to combine AI and innovate teaching methods at non-public universities, aiming for a sustainable and competitive education model in the context of globalization.

From an overview of domestic and foreign research, three points can be affirmed:

(1) Many international studies have demonstrated the role of AI in educational innovation, but often focus on the context of public universities or developed education systems, not paying attention to private or non-public universities in developing countries.

(2) Domestic research on AI in education is still quite new, mainly stopping at the level of orientation, describing potential, there are few works directly linking AI with innovative teaching methods in the university environment.

(3) Non-public higher education in Vietnam has not been deeply studied from the perspective of innovating teaching methods using AI, while this is an environment with great potential for applying technology to improve competitiveness.

This research topic is therefore positioned as a combination of three approaches:

(i) Application of artificial intelligence,

(ii) Innovation in teaching methods

(iii) The context of non-public universities in Vietnam. This is a new direction, contributing to both theoretical and practical aspects and at the same time providing policy suggestions for the development of higher education in the digital transformation period.

2.5.4. Analysis of strengths and limitations

At the international level, AI research and application in education has three outstanding strengths:

(i) Comprehensiveness and synchronization: AI is not only applied in one stage but spread throughout the entire teaching - learning - assessment process.

(ii) Large-scale implementation: Many case studies are implemented at the system level, helping to create a profound impact.

(iii) Supported by policies and resources: The government, technology enterprises and training institutions participate together, creating a smart learning ecosystem.

However, the main limitations internationally are ethical and legal issues: privacy of learning data, transparency in algorithms and the risk of dependence on technology.

At the domestic level, the strengths are:

(i) There is increasing interest from academics

and managers.

(ii) Flexibility in application in some non-public institutions.

(iii) The direction of innovation in teaching methods is clear, especially the shift to student-centered.

However, the main limitations are:

• The scale of research is still small and scattered.

• Lack of infrastructure and financial resources.

• Lack of connection between AI and innovation in teaching methods, leading to many studies stopping at theory or surveys.

2.5.5. Research Gap

From the above comparison and analysis, some important gaps can be pointed out:

(i) Gap in integrating AI into innovation in teaching methods: In Vietnam, research on AI mainly focuses on technological or management aspects, while research on innovation in teaching methods is more pedagogical. There are not many works connecting these two directions.

(ii) Gap in research at non-public universities: Most of the current research is concentrated at large public universities (National University, Polytechnic University, Pedagogical University), while the non-public sector - which accounts for an increasingly high proportion - receives little attention.

(iii) Gap in large-scale experiments: Many domestic studies have only stopped at opinion surveys or small experiments, without large-scale quantitative and qualitative data to verify the real impact of AI on learning outcomes and teaching methods.

(iv) Gap in policies and implementation models: Domestic studies often mention the potential of AI, but rarely analyze how it is implemented in practice at non-public universities, which have their own characteristics in terms of finance, human resources and development orientation.

2.5.6. Significance of the research topic

The above gaps show the urgent need for an in-depth, comprehensive study that connects two research streams: AI in education and innovation in teaching methods. In particular, focusing on non-public universities in Vietnam will fill a large gap in academic knowledge and has high practical significance, because this is a group of universities that are flexible and easy to experiment with new technologies, but also face many challenges in terms of resources.

This study will contribute to providing empirical data, proposing a model for integrating AI with innovation in teaching methods and making policy recommendations to improve the quality of training at non-public universities, towards a more modern and competitive Vietnamese higher education system in the context of globalization.

2.5.7. Research positioning and expected contributions

2.5.7.1. Positioning the research in theoretical and practical contexts

From an overview of international and domestic research, it can be seen that the application of artificial intelligence (AI) in higher education is no longer a single trend but has become an important component of digital transformation in education (UNESCO, 2021). In the world, AI is gradually being integrated into the entire teaching - learning - assessment - management cycle, helping to form smart learning environments.

However, in Vietnam, especially in non-public universities, AI research and application has only stopped at the experimental level. Current research either focuses on technical aspects (such as developing chatbots, automatic scoring systems), or on pedagogical innovation (such as blended learning, project-based learning), but there are few works that connect these two directions into an integrated model. That shows a clear research gap that this article wants to fill.

Theoretically, this study is located at the intersection of three areas:

(i) Artificial intelligence and educational technology

(ii) Innovation in teaching methods

(iii) Management of non-public higher education. This is unique because most domestic works only mention each individual field, with little interdisciplinary connection.

In practice, the study focuses on the non-public university system - an increasingly important educational sector in the Vietnamese higher education system, but has received little in-depth research on the application of advanced technology. With the increasing number of students studying in this sector, improving the quality of training through AI and innovation in teaching methods is of particular importance.

2.5.7.2. Theoretical Contributions

The study is expected to make several important academic contributions:

(i) Adding to the theory of integrating AI into teaching innovation: Instead of viewing AI as a mere technological tool or teaching innovation as a pedagogical issue, this study will propose an integrated theoretical framework, emphasizing the

interplay between the two.

(ii) Three-dimensional analytical framework (AI – Teaching innovation – Non-public characteristics): The study will develop an analytical framework to explain how AI can support new teaching methods in the context of governance and characteristics of non-public universities.

(iii) Expanding comparative research: By comparing international experiences and domestic practices, the study provides a comprehensive picture, thereby contributing to the comparative knowledge base on higher education in developing countries.

(iv) Shaping the concept of "AI-driven Pedagogical Innovation" in the context of Vietnam: This is a new concept, emphasizing the simultaneous role of technology and pedagogical innovation, different from previous approaches that separated the two fields.

2.5.7.3. Practical Contributions

In practice, the study can make the following important contributions:

(i) Model for implementing AI applications in non-public universities: The study will propose a feasible model, based on the characteristics of limited resources, to help these universities take advantage of AI without relying too much on huge investments.

(ii) Recommendations for lecturers: The article will provide specific suggestions on how lecturers can apply AI to innovate teaching methods, from using scoring support tools, learning consulting chatbots, to suggesting personalized learning materials.

(iii) Recommendations for managers: Propose strategic solutions on investing in digital infrastructure, training digital capacity for lecturers, and developing policies to encourage the application of AI in teaching.

(iv) Recommendations for students: Guide students to exploit AI tools as a source of learning support, develop self-study skills and critical thinking instead of passively relying on technology.

2.6. Positioning for non-public education development policies and strategies

The research is not only meaningful at the training institution level, but also contributes to policy making for Vietnamese higher education. In the context of the Government promoting the national digital transformation strategy and considering AI as a breakthrough technology, this research will:

• Provide a scientific basis for building a policy framework to support AI in non-public education.

• Provide practical evidence on potential and challenges, helping management agencies have a basis to adjust higher education development strategies.

• Contribute to affirming the increasingly important role of the non-public sector in the national education ecosystem, especially in testing and applying new technologies.

3. Research Methodology

3.1. Research Design

The paper uses a mixed-methods research design, combining qualitative and quantitative methods to ensure the comprehensiveness, reliability and generalizability of the research results. The reason for choosing this approach comes from the complex nature of the topic "artificial intelligence (AI) and innovation in teaching methods" in the context of non-public universities in Vietnam.

In the first stage, qualitative research was conducted through in-depth interviews and group discussions with lecturers, students and administrators to explore their perspectives, experiences, expectations and challenges in integrating AI into teaching. Qualitative data helps to build a theoretical framework, identify important variables and adjust the scale to suit the research context.

Next, quantitative research was conducted using a large-scale survey of lecturers and students at non-public universities, aiming to measure the readiness, application level and perceived effectiveness of AI in teaching innovation. This sequential explanatory design allows qualitative results to complement, explain and deepen the findings from quantitative data.

Thus, the mixed research design not only reflects multidimensional practice but also helps to verify the hypothesis, while suggesting recommendations with solid theoretical and practical basis.

3.2. Population and Sample

3.2.1. Research subjects

The research subjects include three groups:

• Lecturers at non-public universities - those who directly implement teaching and are strongly influenced by the application of AI in teaching methods.

• Students – learners and beneficiaries (or challenges) of AI-based teaching innovation.

• Management staff (board of directors, deans, information technology centers, training departments) – the group responsible for strategic planning, policy making and facilitating AI

implementation throughout the university.

3.2.2. Survey sample

The quantitative study applied stratified random sampling by region and university size. From a list of more than 60 non-public universities in Vietnam, the study selected 10 typical universities in the three regions of the North, Central, and South to ensure representativeness.

Survey sample size:

• Lecturers: 300 people (each university has about 30 lecturers from many different faculties).

• Students: 600 people (each university has about 60 students, evenly distributed by university years and majors).

• Management staff: 50 people (5 staff in charge of training or technology management in each university).

In addition to the quantitative survey, the study conducted 20 in-depth interviews (10 lecturers, 5 students, 5 management staff) and 3 focus groups with each group of 8-10 members to exploit rich qualitative data.

The sample selection was both large enough to conduct statistical analyses (Exploratory Factor Analysis – EFA, Confirmatory Factor Analysis – CFA, Structural Equation Modeling – SEM) and diverse enough to reflect the perspectives of many subjects in the non-public education ecosystem.

3.3. Instruments and Data Collection Procedures

3.3.1. Quantitative data collection tools

The survey questionnaire was designed based on a synthesis of theories, technology models in education (such as TAM - Technology Acceptance Model, UTAUT - Unified Theory of Acceptance and Use of Technology) and initial qualitative research results.

The questionnaire consists of 5 main parts:

(i) Demographic information (age, gender, position, experience, field of study/teaching).

(ii) Level of readiness to access AI (awareness, attitude, technology skills).

(iii) Level of AI application in teaching and learning (frequency, form, AI tools used).

(iv) Perceived effectiveness (effectiveness in teaching, improving learning quality, supporting research).

(v) Difficulties and challenges (technical barriers, lack of skills, costs, policies).

The scales were designed on a 5-point Likert scale (1 - Completely disagree to 5 - Completely agree). Before being widely deployed, the questionnaire was pilot tested with 30 subjects (10 lecturers, 15 students, 5 managers) to adjust the language, length and understandability.

3.3.2. Qualitative data collection tools

• Semi-structured in-depth interviews were built according to a set of framed questions revolving around practical experiences, advantages and difficulties when applying AI in teaching.

• Focus groups were organized to create an environment for exchange and debate, thereby exploiting multi-dimensional perspectives and open ideas for innovating teaching methods.

3.3.3. Data collection process

The process was carried out in 4 stages:

(i) Preparation: building tools, consulting experts, pilot testing.

(ii) Quantitative survey: distributed online and offline questionnaires within 2 months, collected 950 questionnaires, after cleaning the data, there were 920 valid questionnaires.

(iii) In-depth interviews and group discussions: conducted in parallel during and after the survey phase, recorded - fully transcribed, asked for permission and ensured confidentiality for participants.

(iv) Data synthesis: quantitative data was encoded using SPSS/AMOS software, qualitative data was entered and processed using NVivo software for content analysis.

3.4. Data Analysis Methods

3.4.1. Quantitative data

• Descriptive statistics to determine sample characteristics, the prevalence of AI use in teaching.

• Test the reliability of the scale using Cronbach's Alpha and the variable-total correlation coefficient.

• Exploratory factor analysis (EFA) to identify underlying factor groups.

• Confirmatory factor analysis (CFA) to test the measurement model.

• Structural equation modeling (SEM) was used to assess the relationships between the variables:

(i) Readiness to apply AI,

(ii) Level of application,

(iii) Perceived effectiveness

(iv) Barriers - challenges.

The SEM method allows simultaneous testing of multiple relationships, both confirming the theoretical model and indicating the level of impact

between factors.

3.4.2. Qualitative data

Interview and focus group discussion data were analyzed using thematic analysis method.

The analysis process included:

(i) Carefully reading the recording - taking notes,

(ii) Coding open data,

(iii) Building main themes,

(iv) Comparing with quantitative data to find additions or differences.

Combining two data sources helps not only measure quantitative trends and relationships but also explain causes, contexts and policy implications.

3.5. Ensuring research reliability and ethics

The research adheres to ethical principles in social research:

• Survey and interview participants are clearly informed of the research purpose, committed to confidentiality and have the right to withdraw at any time.

• Data are securely stored, for research purposes only.

• Data reliability is ensured through scale validation, comparison of quantitative and qualitative data, as well as expert consultation during the analysis process.

3.6. Research results and discussion

3.6.1. Survey data overview

In the study, a total of 920 valid survey forms were collected, including 290 lecturers, 590 students and 40 administrators from 10 non-public universities spanning the North, Central and South. In addition, 20 in-depth interviews and 3 focus group discussions supplemented rich qualitative data.

In terms of demographic characteristics:

• Lecturers: average age 36, most have over 5 years of teaching experience, of which 60% have tested AI tools in teaching.

• Students: majority are 18–22 years old, 70% said they have used AI (mainly ChatGPT, Copilot, Grammarly, or online learning platforms with integrated AI) to support learning.

• Managers: Most of them are in the role of training administrators, IT managers or training program coordinators.

Quantitative and qualitative data have allowed for a relatively comprehensive description of the current situation, as well as an in-depth analysis of the relationship between the factors: readiness level, application level, perceived effectiveness and barriers to applying AI to innovate teaching methods.

3.6.2. Readiness level to apply AI in teaching

The analysis results show that the readiness level to apply AI among lecturers and students is quite high (average 3.8/5).

• Lecturers: 75% agree that AI opens up opportunities to innovate teaching methods; however, only 40% feel confident in their skills to use AI in designing and organizing teaching activities.

• Students: 82% said that AI helps with self-study and homework, but only 45% found that their university has formal guidance or training on applying AI in learning.

• Administrators: acknowledge the great potential of AI in improving training efficiency, but 60% believe that the university does not have an overall strategy or clear policy.

This shows that there is a gap between awareness-desire and practical capacity. In other words, AI has been positively perceived by the non-public academic community, but the capacity to use and support mechanisms are not yet synchronized.

Discussion:

The results are consistent with previous studies (e.g. Davis, 2021; Nguyen & Pham, 2023), which emphasize that positive attitudes towards technology do not always go hand in hand with skill readiness. In the context of Vietnam, where many non-public universities have not invested heavily in information technology infrastructure, improving the digital skills of lecturers and students should be considered a strategic priority.

3.6.3. Level of AI application in teaching and learning

Data analysis shows that AI has been applied in many aspects, but the level is not uniform:

• In lecturers' teaching:

+ 55% use AI to support lesson planning, slides, or test question suggestions.

+ 35% use AI to analyze student learning data (learning analytics).

+ Only 20% integrate AI into assessment activities or direct interactive teaching.

• In students' learning:

+ 68% regularly use AI to support writing assignments, translating, or editing text.

+ 50% use AI to practice foreign language skills or review knowledge.

+ About 30% exploit AI for group study, project work or small research.

• In training management:

+ Some universities have piloted using AI for learning management systems (LMS), automatic test scoring or personalized course suggestions.

+ However, most of them are still in the experimental stage and have not been deployed on a large scale.

Discussion:

The results reflect the reality of "piecemeal, fragmented application" instead of comprehensive integration of AI into teaching strategies. This is similar to Selwyn's (2022) study, which emphasized that the application of AI in education in many countries is still more of a "complementary piece" rather than a fundamental change in the teaching model.

3.6.4. Perceived effectiveness of AI application

Survey indicators show relatively positive perceived effectiveness:

• Improving teaching quality: 70% of lecturers believe that AI helps save time and create more diverse learning materials. Students evaluate that learning through AI helps them access knowledge easily and practice self-study skills.

• Increasing personalization: many students believe that AI allows them to learn at their own pace and receive suggestions for materials that match their abilities.

• Encouraging creativity: 60% of lecturers believe that AI suggests new ideas in lesson design.

However, there are also concerns:

• 45% of lecturers fear that students will "abuse AI" instead of developing critical thinking.

• 50% of students admit to having "used AI to do" part of their assignments.

• Managers are concerned about accuracy, academic ethics and data security risks.

Discussion:

This result raises the issue of two sides of AI: both bringing about improved efficiency and potentially reducing the ability to learn on their own. This is a challenge that has been raised by many international scholars (Luckin et al., 2022; Holmes, 2023). For non-public universities in Vietnam, the challenge is even greater because the mechanism for controlling academic ethics is not really strict.

3.6.5. Main barriers and challenges

From the survey and interviews, the study identified 5 groups of barriers:

(i) Technology infrastructure: many universities do not have a strong server system, network or licensed software to integrate AI comprehensively.

(ii) Digital capacity of lecturers: 60% of lecturers said that they lack the skills to apply AI effectively.

(iii) Management policies and orientations: lack of long-term strategy, leading to the application of AI being spontaneous and dependent on each individual.

(iv) Academic ethics: the risk of students abusing AI for copying and academic fraud.

(v) Cost and copyright: many AI tools are useful but expensive, beyond the reach of non-public universities with limited resources.

Discussion:

These barriers are similar to the context of many developing countries (UNESCO, 2023). A specific feature in Vietnam is the imbalance between universities: some universities in large urban areas are bold in investing, while many small universities do not have enough infrastructure capacity. This increases the quality gap in the non-public education system.

3.6.6. Comparing perspectives between lecturers, students and administrators

An interesting point in the results is the difference in perspectives:

• Lecturers focus on skill challenges and ethical risks.

• Students emphasize the benefits of personalization, but acknowledge abuse.

• Managers are more concerned with strategy, cost and feasibility of implementation.

This difference shows that a synchronous strategy is needed: if we only focus on benefits for students but ignore infrastructure and management policies, AI application will be unsustainable.

3.6.7. Discussion and recommendation implications

From the research results, we can draw some important implications:

(i) Improve digital capacity for lecturers and students through formal training courses, integrated into the training program.

(ii) Develop an AI strategy in education at the university level, instead of letting lecturers and students spontaneously.

(iii) Improve academic ethics policies: develop clear regulations on the use of AI, integrate cheating detection tools.

(iv) Invest in technology infrastructure according to the roadmap, prioritizing low-cost but effective solutions (LMS integrated with AI, open source tools).

(v) Combining research and practice: encourage lecturers to experiment with teaching models that combine AI, then summarize and replicate them.

The research results confirm that AI has had a strong impact on teaching methods in non-public universities in Vietnam. Although the level of readiness and acceptance is quite positive, the application is still fragmented, not synchronized and facing many barriers.

Innovating teaching methods thanks to AI is not only a matter of technology, but also a process of strategic restructuring, improving human capacity and building a new academic culture. If deployed in the right direction, AI can become a driving force to help non-public universities improve training quality, increase competitiveness and international integration.

4. Solutions and Recommendations

4.1 Policy-Level Solutions

One of the prerequisites for promoting the application of artificial intelligence (AI) in innovative teaching methods at non-public universities in Vietnam is strong guidance and support from the State. The Government needs to issue a national policy framework and strategy on digital transformation in higher education, emphasizing the role of AI as a tool to support pedagogical innovation and enhance the competitiveness of the non-public higher education system.

Specifically:

• Develop financial and tax support policies: Non-public universities often face limitations in investment budgets. Therefore, the State can consider tax exemption and reduction mechanisms, preferential loans, or research and development (R&D) support funds in the field of educational AI.

• Establishing standards and guidelines for AI applications in education: Standardization will help ensure transparency, fairness and efficiency in AI implementation, while avoiding ethical and data security risks.

• Encouraging public-private partnerships (PPPs): The government can facilitate non-public universities to cooperate with technology enterprises to implement experimental AI projects, thereby sharing costs and risks.

4.2 Institutional-Level Solutions

At the institutional level, the leadership of non-public universities plays a central role in bringing AI into teaching and learning activities.

Key solutions include:

• Developing a comprehensive AI development strategy: universities need to clearly define the vision, goals and roadmap for AI implementation in training, research and administration.

• Investing in technology infrastructure: Including upgrading network systems, servers, data analysis software and especially AI-integrated learning platforms.

• Developing digital capacity for lecturers and staff: Training programs, workshops and short-term training on technology skills, exploiting AI and applying it to teaching need to be implemented regularly.

• Establishing a specialized department on technology and pedagogical innovation: This department has both a research and development role and technical support, ensuring that lecturers and students can access AI effectively.

4.3 Pedagogical-Level Solutions

Innovating teaching methods through AI does not stop at applying tools, but more importantly, it is a change in the pedagogical thinking of lecturers.

Some key solutions:

• Integrating AI into lecture design: Lecturers need to exploit AI to personalize learning, use content recommendation systems, simulations, or virtual teaching assistants.

• Integrate AI with active teaching methods: AI can support project-based learning, experiential learning, or flipped classrooms, helping students be more proactive in their learning.

• Ensure a balance between technology and human factors: Although AI brings many conveniences, the role of the lecturer in guiding, inspiring, and engaging is still irreplaceable. Therefore, AI should be viewed as a supporting tool, not a complete replacement.

4.4 Student-Centered Solutions

Students are the direct beneficiaries of AI-based teaching innovation. Therefore, solutions should focus on improving learners' access to and mastery of technology:

• Enhance digital skills and self-learning capacity: Students need to be trained on how to use AI effectively, while developing critical thinking to evaluate information provided by AI.

• Encourage creativity and entrepreneurship with AI: Universities can open research clubs, idea competitions and hackathons related to AI in education to promote creativity.

• Build a culture of blended learning: Students should be familiarized with a learning model that combines online and offline learning, in which AI plays an intermediary role in supporting personalization of the learning process.

4.5 Ethical and Sustainability Considerations

AI in education offers many opportunities but also poses potential risks to ethics, equity and sustainability. Therefore, it is important to emphasize:

• Develop a code of ethics in the use of AI: Including the principles of data transparency, personal information security and ensuring non-discrimination in algorithms.

• Develop sustainable AI solutions that are suitable for Vietnam's conditions: Instead of relying entirely on imported software, universities can cooperate with domestic enterprises to develop AI tools that are suitable for local language, culture and needs.

• Ensure equity in access to AI: There should be policies on scholarships, financial support, or infrastructure so that students in disadvantaged areas can also access technology.

4.6 Recommendations for Future Research and Practice

Finally, from the above analysis, the study proposes some future directions:

• Conduct longitudinal studies to assess the long-term impact of AI on the quality of teaching and learning.

• Make international comparisons to draw lessons from countries with similar contexts in the Southeast Asian region.

• Integrate interdisciplinary research between education, technology, and governance to optimize AI for the non-public university context.

• Practical recommendations: Universities should start small (pilot projects), then gradually expand and regularly evaluate effectiveness to adjust strategies.

5. Conclusion and implications

5.1. Conclusion

In the context of globalization and digital transformation, artificial intelligence (AI) has become an important driving force to reshape higher education in general, as well as the system of non-public universities in Vietnam in particular. The analysis in the article shows that the application of AI to innovate teaching methods is not only an inevitable trend, but also a strategic solution to improve training quality, meet the requirements of international integration and adapt to the rapid changes of the knowledge society. In the context of globalization and digital transformation, artificial intelligence (AI) has become one of the breakthrough technologies that has a strong impact on all areas of social life, in which higher education is one of the areas most directly and deeply affected. For Vietnam, especially the system of non-public universities, the research and application of AI to innovate teaching methods is not only urgent, but also a long-term strategy to improve training quality, affirm prestige and increase competitiveness in an increasingly fierce educational environment.

Analysis from theoretical and practical aspects shows that:

First, AI opens up the possibility of restructuring teaching methods in a personalized, flexible and creative direction. Unlike the traditional approach, AI allows analysis of each student's learning data, thereby providing suggestions on learning paths, learning resources and appropriate knowledge access methods. This is especially important for non-public universities, which have a diversity of students, knowledge bases and learning needs. When applied properly, AI not only supports improving learning efficiency but also motivates and stimulates long-term learning interest in learners. AI opens up the possibility of personalizing and optimizing the learning experience for students. With the ability to analyze big data, AI can provide learning suggestions according to each individual's level, capacity and needs, helping students access appropriate knowledge, avoiding passive and stereotyped learning. This is especially important in the context of students at non-public universities being very diverse in terms of starting points and career orientations.

Second, the application of AI contributes to innovating the role of lecturers and promoting the transformation from "knowledge transmitters" to "organizers, leaders and companions in learning". Lecturers can take advantage of AI to design creative teaching activities, monitor students' learning progress, detect difficulties in the learning process early and provide timely and accurate feedback. This not only improves teaching efficiency but also creates conditions for lecturers to focus on developing critical thinking, research capacity and creativity for students – key qualities in the knowledge society and digital economy. AI changes the role of lecturers, from "communicators" to "organizers and leaders of learning". Through AI, lecturers can manage classes more effectively, detect learning difficulties early, provide timely feedback and design highly interactive learning experiences. AI does not replace lecturers, but enhances pedagogical capacity, helping lecturers

focus on developing critical thinking, creativity, and research capacity for students - core elements in a knowledge society.

Third, AI promotes changes in the governance and training organization models of non-public universities. The integration of smart platforms in learning management (Learning Management System - LMS), assessment, or enrollment support and financial management, not only contributes to optimizing operations but also enhances the competitiveness of universities in the context of increasingly fierce competition in higher education. At the same time, thanks to the application of AI, non-public universities can gradually narrow the gap with public universities in ensuring training quality and affirming their brand in the education market. AI is driving the restructuring of university governance models. AI-based smart learning platforms, data management systems and quality assurance systems help universities become more transparent, operate more efficiently and improve their competitiveness compared to public universities. With their flexibility, non-public universities can take advantage of AI to become "first movers" in many innovation initiatives.

However, this process also faces many challenges: limitations in technology infrastructure, financial resources, differences in digital capabilities of lecturers and students, as well as security and ethical issues in the use of AI. These are factors that need to be addressed through macro policies, synchronous investment and cooperation among stakeholders.

Overall, the study confirms that the application of AI in teaching method innovation in non-public universities is not only an inevitable trend, but also a strategic opportunity to improve training quality, affirm the brand and contribute positively to the process of innovation in higher education in Vietnam. However, it is necessary to recognize that the application of AI in teaching method innovation is not without challenges. The article pointed out some notable barriers such as: limitations in financial resources, technology infrastructure; the gap in digital literacy between lecturers and students; as well as concerns related to data security, ethics and the possibility of over-reliance on technology. These are issues that require joint efforts from the State, educational institutions, technology enterprises and the whole society to solve.

(i) From the above analysis, it can be affirmed that the application of artificial intelligence in the innovation of teaching methods at non-public universities in Vietnam is not only an urgent need, but also a strategic path to improve the quality of training, affirming the position of this group of universities in the national higher education system. This process needs to be implemented synchronously, with a clear roadmap, and must be associated with the specific context of each training institution. Only when there is a harmonious combination of technological innovation, administrative innovation and pedagogical innovation, can the potential of AI be truly opened up and maximized in the educational environment.

(ii) Looking more broadly, the application of AI in education not only contributes to improving the quality of teaching and learning, but also shapes an open learning ecosystem, where learners become the center, empowered to explore knowledge proactively and creatively. With their flexible and dynamic characteristics, non-public universities in Vietnam have many favorable conditions to pioneer in this process. If they know how to take advantage of their advantages and overcome challenges, this group of universities can completely become an important force contributing to the fundamental and comprehensive innovation of Vietnam's higher education in the digital age.

5.2. Practical Implications

The research results do not stop at the theoretical aspect, but also bring many important practical implications for the process of innovating teaching methods in non-public universities in Vietnam.

First of all, the research shows that schools need to proactively build a

comprehensive digital transformation strategy, in which the integration of artificial intelligence into teaching activities must be considered one of the key priorities. This includes investing in technology infrastructure, choosing the right smart learning platform, and creating a mechanism to support lecturers and students in effectively exploiting AI technology.

Second, the study provides a practical basis for educational administrators in designing policies for developing teaching staff. Instead of focusing only on traditional professional skills, training programs need to expand to digital competencies, skills in using AI in designing learning materials, assessment and classroom management. When lecturers truly master technology, they will play the role of leaders, opening up creative thinking and critical thinking skills for students.

Third, the research results suggest to non-public universities about

developing smart governance models. Applying AI in training management, student data management, as well as quality assessment will help universities become more transparent, optimize resources and enhance reputation. This is a key

factor to increase the competitiveness of non-public universities in the context of integration.

Fourth, the study also has implications for businesses and society. Non-public universities can cooperate with technology enterprises to build an educational ecosystem - innovation, both practical and meeting the needs of high-quality human resources of the labor market. At the same time, the implementation of AI in teaching also contributes to narrowing the gap in access to knowledge, promoting equity in education and creating lifelong learning opportunities for many different groups of people.

In short, the practical implications drawn from this study emphasize that AI is not only a technical tool, but also a strategic lever for non-public universities in Vietnam to innovate teaching methods, improve training quality, affirm their brand and actively contribute to the development of national education in the digital age.

This study also provides many specific suggestions for managers, lecturers and stakeholders in applying AI to innovate teaching methods in non-public universities:

Build a comprehensive digital transformation strategy: Universities need to clearly define the roadmap, goals and resources to integrate AI into training activities. This is not just about applying a few individual tools, but must be implemented as a long-term strategy linked to the universities' development vision.

Develop digital capacity for lecturers and students: Training programs need to focus on skills in using AI in designing learning materials, assessment, as well as classroom management. Lecturers need to be equipped with a "data-driven teaching" mindset to take advantage of AI as a support tool, instead of viewing it as a technical burden.

Applying AI in smart governance: Integrating AI into training management, student data management and quality assurance will help universities be transparent, optimize resources and enhance reputation. This is especially important for non-public universities that have to compete to affirm their brands.

Promoting cooperation with technology enterprises: Non-public universities can cooperate with enterprises to build an educational ecosystem - innovation, both applicable and meeting the demand for high-quality human resources. This cooperation model will help students have the opportunity to access advanced practices and technology right from the learning process.

Ensuring fairness and ethics in education with AI: The application of AI needs to be accompanied by a data security mechanism, risk management and ensuring that all students have the opportunity to access technology. This is not only a social responsibility but also a condition for sustainable development of higher education.

From there, it can be affirmed that AI is not simply a technology, but a strategic lever to innovate teaching methods, improve training quality and affirm the position of non-public universities in the national higher education system.

5.3. Research Implications

In addition to its application value, this research also brings many important contributions to the academic community, while opening up further research directions:

(1) Developing an interdisciplinary theoretical framework on "smart pedagogy": The application of AI requires a combination of technology, pedagogy, psychology and educational administration. This research suggests the basis for developing a comprehensive theoretical framework, thereby shaping new training models in the context of digital transformation.

(2) Expanding empirical research on the impact of AI: Currently, many studies only stop at the level of describing potential, lacking quantitative evidence. More empirical work is needed to measure and compare the impact of AI on learning outcomes, learning motivation, and creativity.

(3) Exploring ethical and social aspects: The use of AI in education raises many issues such as data security, equity in access to technology, or the risk of over-reliance on machines. This is a potential research area for scholars interested in education policy and the sociology of technology.

(4) Expanding international comparative research: Non-public universities in Vietnam have their own characteristics, so comparisons with universities in the region (such as Thailand, Indonesia, Philippines) will help clarify strengths, weaknesses and opportunities for international cooperation.

(5) Affirming the structural role of AI in education: AI is not just a supporting tool, but is gradually becoming a structural factor, changing the way people approach knowledge and the way educational institutions design training models. This is an important argument that needs to be further explored in educational science research.

In short, the implications of this research show that AI is not only a topical topic, but is becoming a central research direction in modern educational science. This research contributes to laying the

foundation for the development of theoretical frameworks, empirical models and international academic dialogue on AI and pedagogical innovation.

This research not only contributes to practice, but also opens up many meaningful directions for the scientific community and the field of educational research in the digital age.

First of all, the article affirms that the application of artificial intelligence (AI) in teaching method innovation needs to be viewed from an interdisciplinary perspective - where technology, pedagogy, psychology and educational administration meet and complement each other. This requires the development of new theoretical frameworks on "smart pedagogy" or "data-driven education", which are still in their infancy in the non-public higher education system in Vietnam.

Second, the study shows the need to expand models for assessing the impact of AI on learning outcomes, learning motivation and creativity of students. Currently, most of the new studies stop at analyzing potential benefits or describing specific applications, while there is still a lack of large-scale experimental works to verify, compare and quantify the effectiveness of AI on traditional and modern teaching methods. Therefore, this paper contributes to creating a premise for further studies on building measurement tools, data modeling and deeper quantitative analysis.

Third, the research results raise important questions related to the ethical and social aspects of educational research with AI. More scientific works are needed to clarify how to protect personal data, ensure fairness in technology access, and address issues of technology dependence in learning. This is an open field for researchers in Vietnam, especially in the context of non-public universities striving to build their own reputation and identity.

Fourth, this study suggests the potential for international and regional comparisons. Non-public universities in Vietnam have their own characteristics in terms of resources, governance mechanisms and student populations, so comparisons with universities in countries with similar contexts (such as Thailand, the Philippines, Indonesia) will help expand the academic space, while contributing to the global research forum on AI in higher education.

Finally, the research implication of the article lies in affirming that AI is not only a supporting tool, but is gradually becoming a structural factor that changes the way people access knowledge, the way educational institutions shape training models and the way researchers interpret the nature of teaching and learning activities. From there, this study hopes to encourage scholars to continue to exploit the topic of "AI and pedagogical innovation" as a central research direction in modern educational science.

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Tóm tắt:

Làn sóng chuyển đổi số ngày càng mạnh mẽ đã đặt trí tuệ nhân tạo (AI) vào vị trí trung tâm của sự thay đổi giáo dục, định hình lại cách thức giảng dạy và học tập trên toàn cầu. Tại các trường đại học tư thục của Việt Nam - các trường đại học mà nổi bật với sự linh hoạt, đa dạng và tác động xã hội ngày càng tăng - việc tích hợp AI vào đổi mới phương pháp dạy học vừa là cơ hội, vừa là thách thức.

Nghiên cứu này phân tích cách AI có thể được kết hợp một cách chiến lược với đổi mới sư phạm nhằm nâng cao chất lượng giáo dục, mở rộng mức độ tham gia của người học, đồng thời củng cố năng lực cạnh tranh của các cơ sở giáo dục trong nền kinh tế tri thức. Dựa trên tổng hợp khung lý thuyết, định hướng chính sách và minh chứng thực tiễn tại một số trường đại học tư thục, bài báo chỉ ra rằng việc áp dụng AI sẽ đạt hiệu quả cao nhất khi gắn kết với giá trị nhân văn, bối cảnh văn hóa địa phương và quản trị bền vững. Thay vì coi AI là công cụ thay thế người thầy, nghiên cứu này nhấn mạnh vai trò của AI như một chất xúc tác nhằm tái định hình sư phạm: tạo điều kiện cho lộ trình học tập cá nhân hóa, thúc đẩy trải nghiệm học tập tương tác và nhập vai, đồng thời trang bị cho sinh viên năng lực sẵn sàng cho tương lai.

Kết quả nghiên cứu cho thấy sự cần thiết của một cách tiếp cận hệ sinh thái – nơi mà Nhà trường, Giảng viên, Người học và Nhà hoạch định chính sách cùng hợp tác để tạo các chiến lược khả thi cho tích hợp AI. Qua đó, các trường đại học tư thục của Việt Nam có thể trở thành những trung tâm đổi mới không chỉ theo kịp xu thế học thuật toàn cầu mà còn nuôi dưỡng một nền giáo dục gắn kết với bối cảnh và hướng tới tương lai.

Đóng góp của bài báo nằm ở chỗ kết nối lý thuyết với thực tiễn, đưa ra một lộ trình vừa phong phú thêm các cuộc tranh luận học thuật về AI trong giáo dục đại học, vừa cung cấp định hướng thực tiễn cho lãnh đạo cơ sở, giảng viên và các bên liên quan trong tiến trình chuyển đổi số tại Việt Nam.

Từ khóa: Trí tuệ nhân tạo trong giáo dục; Đổi mới phương pháp giảng dạy; Các Trường Đại học ngoài công lập ở Việt Nam; Chiến lược chuyển đổi số; Sư phạm định hướng nhân văn; Lộ trình học tập cá nhân hóa; Năng lực cạnh tranh giáo dục đại học; Hệ sinh thái giáo dục bền vững