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Digital Technology in Transforming University Teaching Approaches in Vietnam: Opportunities, Challenges and Directions

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ABSTRACT: Digital technology is reshaping the organization, interaction, and assessment of higher education, yet its value depends on pedagogical design and implementation conditions. This article addresses three questions: how technology changes the roles of lecturers and students; how it affects teaching formats, learning resources, interaction, and assessment; and which priorities Vietnam should pursue. The literature synthesis indicates that lecturers increasingly design and facilitate learning, students gain greater autonomy, and teaching becomes more flexible, blended, and personalized. However, digital inequality, uneven competencies, data governance, copyright, and artificial intelligence ethics remain significant constraints. The article recommends coordinated action at national, institutional, and individual levels, with investment in infrastructure, professional development, quality assurance, responsible technology governance, and learning-centered course design.

KEYWORDS: digital technology, digital transformation, higher education, personalized learning, teaching approaches.

1. INTRODUCTION

Digital technology has become a permanent feature of higher education. Learning management systems (LMSs), digital learning resources, online classrooms, collaborative tools, learning analytics, artificial intelligence (AI), and simulation technologies have expanded the learning environment. This transformation is not simply the conversion of printed materials into electronic files. When integrated into courses, technology can reshape content delivery, interaction, progress monitoring, feedback, and assessment. The OECD (2023) distinguishes digitalization from digital transformation: the former may reproduce old processes on new platforms, whereas the latter entails changes in pedagogy, organization, and governance. Digital environments enable students to access resources flexibly, participate in learning communities beyond physical locations, and receive ongoing support. Digital platforms also help lecturers organize courses, assign tasks, and provide feedback. Nevertheless, UNESCO (2023) cautions that technology does not automatically improve educational quality; outcomes depend on access, contextual suitability, user competence, and instructional design. AI adds another dimension by supporting information retrieval, learning-material generation, pathway recommendations, and initial feedback. These benefits are accompanied by risks concerning accuracy, bias, privacy, copyright, and the substitution of cognitive effort. Miao and Holmes (2023) advocate a human-centered approach in which technology supports, rather than undermines, the agency of lecturers and students.

In Vietnam, Decision No. 131/QD-TTg identifies the enhanced use of information technology and digital transformation as priorities for education during 2022–2025, with a vision to 2030 (Prime Minister of Vietnam, 2022). Yet readiness varies among institutions in infrastructure, resources, digital competence, technical support, and quality assurance. This article addresses three research questions: (RQ1) How does digital technology change the roles and competency requirements of lecturers and students? (RQ2) How does it influence teaching formats, learning resources, interaction, and assessment? (RQ3) Which directions should Vietnam prioritize? The study reviews, analyzes, and synthesizes secondary literature.

2. RESEARCH CONTENT

2.1. Theoretical framework and research methodology

University teaching approaches refer to the organization of objectives, content, activities, interaction, learning materials, and assessment to enable students to achieve intended learning outcomes. This concept encompasses course structure, the balance between face-to-face and online learning, learner autonomy, feedback mechanisms, and the use of data. In traditional models, lecturers generally control instructional pacing and knowledge sources. Online environments extend access to learning materials and facilitate synchronous and asynchronous communication. Anderson (2008) conceptualizes online teaching as an interactive system linking learners, teachers, and content, rather than merely transferring lectures to the internet. The emphasis consequently shifts from information transmission toward designing conditions for students to engage with and apply knowledge. Blended learning is a prominent example. Hrastinski (2019) argues that blending can involve space, time, methods, media, and interaction types. Genuine course innovation occurs only when online and face-to-face components complement each other. Students may acquire

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foundational knowledge before class, leaving classroom time for problem-solving and critical discussion. Personalized learning involves adjusting content, pace, support, and feedback. LMSs, learning analytics, and AI can provide evidence of learning progress and recommend resources. Nevertheless, algorithms should not independently determine learning pathways. Student choice, lecturer oversight, and data protection must be maintained (UNESCO, 2023). Lecturers' digital competence mediates the relationship between technology and teaching quality. The DigCompEdu framework addresses digital resources, teaching and learning, assessment, learner empowerment, and the development of learners' digital competence (Redecker, 2017). Operational familiarity with software is insufficient; lecturers must select technologies in accordance with learning objectives and use data responsibly. For students, digital learning requires self-regulation. Broadbent and Poon (2015) emphasize time management, metacognition, effort regulation, and critical thinking. Simulation technologies also extend experiential learning opportunities, although their effectiveness depends on task design and alignment with course objectives (Radianti et al., 2020). Accordingly, this article considers technological effects to arise from interactions among technological features, pedagogical design, stakeholder competencies, and governance conditions.

This article employs a review and analysis of secondary sources, including open-access academic books, peer-reviewed articles, UNESCO and OECD reports, European Union competency frameworks, and Vietnamese policy documents. Sources were required to be directly relevant, have identifiable and verifiable publication details, and be available in full text without charge or through lawful links. The materials were read, coded thematically, compared, and synthesized into themes covering lecturers, students, teaching formats, assessment, opportunities, challenges, and implementation directions. This is not a PRISMA-based systematic review. Two tables were developed by comparing functions, implications, and implementation conditions; the conceptual figure illustrates the mechanism of influence and contextual conditions.

2.2. Effects of digital technology on lecturers' roles

Digital technology shifts the focus of lecturers' work. When resources are provided in advance or remain accessible for review, synchronous interaction can be devoted more extensively to explanation, discussion, critique, and application. Lecturers increasingly become learning-experience designers who select resources, organize tasks, and facilitate students' learning rather than primarily transmitting information.

This shift raises the demands of course design. Lecturers must determine which content is appropriate for video, text, simulation, or face-to-face discussion, and connect these elements into a purposeful sequence. If online activities merely repeat classroom lectures, technology increases workload without improving the learning experience.

An LMS enables assignment delivery, discussion forums, and progress tracking. Such data can help identify students who require additional support, but login frequency alone does not adequately reflect the quality of their thinking. Lecturers should therefore combine platform data with student work and direct interaction.

AI can support planning, example generation, and feedback suggestions; however, its outputs must be checked for accuracy, bias, copyright compliance, and data-related risks. Miao and Holmes (2023) emphasize pedagogical and ethical review. These new responsibilities require subject knowledge, pedagogical expertise, technological and data literacy, ethical judgment, technical support, and appropriate institutional recognition.

2.3. Effects of digital technology on students' learning activities

Digital technology increases flexibility. Students can access documents, videos, forums, and tasks outside scheduled classes. The ability to revisit content accommodates different learning speeds, while open resources and online courses extend learning beyond prescribed curricula.

Greater flexibility also entails greater responsibility. Students must manage their time, set goals, and monitor progress. Self-regulated learning strategies play an important role in asynchronous courses (Broadbent & Poon, 2015). Accordingly, course activities should include guidance on study planning, source evaluation, and seeking support.

Technology also supports collaboration and personalization. Students may co-author documents, review peers' work, or undertake projects across geographical locations. Digital systems can recommend exercises and provide feedback. Generative AI can help generate ideas, but fluent responses are not necessarily accurate. If these tools replace reading, reasoning, and writing, students' products may appear better without a corresponding development of competence.

Other risks include digital overload and unequal access. Multiple platforms, constant notifications, inadequate devices, and unsuitable learning spaces may reduce concentration. Courses therefore need simple, accessible structures and alternative arrangements.

2.4. Transformation of teaching formats

Online learning, blended learning, and flipped classrooms are widely used formats. Online learning may be synchronous through videoconferencing or asynchronous through resources and forums. Blended learning deliberately distributes activities across face-to-face and online environments. In a flipped classroom, foundational knowledge is studied before class, while class time is reserved for problem-solving. The value of these formats lies in their design. An effective model specifies what students do before, during, and after class, how lecturers support them, and which evidence is used for assessment. Technology also enables project-based, collaborative, and simulation-based learning. Virtual reality can provide safe practice environments, but it must be linked to authentic tasks and reflection. Radianti et al. (2020) highlight the potential of virtual reality while noting shortcomings in theoretical foundations and long-term evaluation.

Table 1 summarizes the major technological categories. The stated effects represent pedagogical possibilities, not automatic outcomes.

Table 1. Digital technologies and changes in university teaching approaches

Technology	Function	Implications for lecturers	Implications for students	Conditions or risks
Learning management systems	Organize content, tasks, and communication	Course design, monitoring, feedback	Centralized access; self-paced progression	Risk of becoming a mere repository; misinterpreting data

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Open resources and online courses	Expand content sources	Curate and guide resource selection	Access varied learning resources	Quality, copyright, language
Artificial intelligence	Content suggestions, dialogue, feedback	Support design and quality review	Personalized support and idea generation	Inaccuracies, dependency, privacy
Learning analytics	Aggregate learning traces	Identify support needs	Receive alerts and recommendations	Excessive surveillance; lack of transparency
Collaborative tools	Co-authoring and projects	Organize teams and peer review	Location-independent collaboration	Channel overload; privacy
Virtual reality and simulation	Scenario-based practice	Design scenarios and reflection	Safe experimentation	Cost, devices, misalignment with objectives
Digital assessment	Testing and feedback	Faster processing	Timely results	Cheating, authentication, superficial assessment

Source: Compiled by the author from Anderson (2008), OECD (2023), Radianti et al. (2020), Redecker (2017), and UNESCO (2023).

As shown in Table 1, technology can generate both benefits and risks. Technology selection should begin with learning objectives, learner characteristics, and implementation capacity.

2.5. Transformation of assessment and feedback

Digital technology makes formative assessment more feasible. Lecturers can use short quizzes, journals, forums, staged assignments, and progress data to identify students' understanding. Online or automated feedback enables assessment to become an integral part of learning rather than being confined to the end of a course.

However, answers to online tests can easily be shared, and generative AI diminishes the evidential value of tasks requiring only information reproduction. Solutions should not rely solely on surveillance or AI-content detection, as these tools have limitations and can interfere with privacy.

Assessment should require students to explain their reasoning, apply knowledge to specific situations, defend their work, and reflect on their learning. Final products can be combined with drafts, process logs, oral discussions, and peer review. Where AI use is permitted, lecturers should specify its acceptable scope, disclosure requirements, and criteria for assessing students' own contributions. Data should support, rather than independently determine, assessment decisions.

2.6. Opportunities and challenges in Vietnam

Digital technology broadens access to learning resources, experts, and activities beyond class hours. Institutions can share resources and offer flexible courses, allowing interactive time to focus more on application and critique. Open educational resources and collaborative tools may also facilitate academic internationalization (UNESCO, 2021).

The digital divide remains a major challenge, encompassing not only devices but also bandwidth, learning space, skills, and support. Digital competencies are uneven among both lecturers and students, while fragmented platforms increase the administrative burden. The OECD (2023) therefore recommends a connected ecosystem encompassing administration, teaching, assessment, and human resources.

Attention must also be paid to resource quality, data, and privacy. Digitizing documents does not automatically produce educationally valuable resources. Learning materials should be well structured, accessible, and transparent regarding copyright. Platforms collect personal and behavioral data, and inadequate rules for use and retention increase associated risks.

Figure 1 summarizes the mechanisms through which digital technology influences the learning environment, stakeholder roles, activities, and assessment.

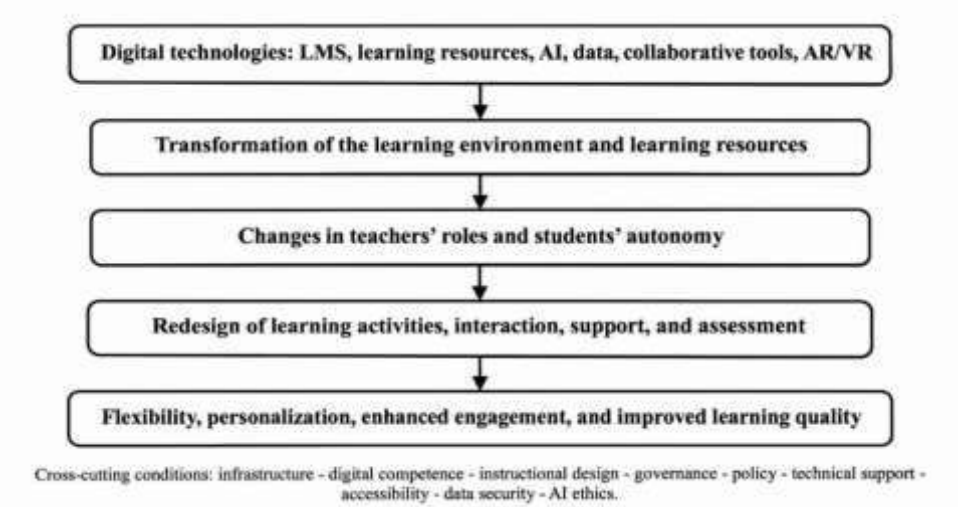

Figure 1. Mechanism through which digital technology influences university teaching approaches
Source: Proposed by the author based on Anderson (2008), OECD (2023), Redecker (2017), and UNESCO (2023).

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Figure 1 indicates that digital technology does not influence university teaching approaches through a single, linear mechanism; rather, the effects arise through multiple interconnected stages. Technology first changes the learning environment and access to resources, then affects lecturers' roles, students' autonomy, the organization of activities, interaction, and assessment. Outcomes also depend on infrastructure, digital competence, instructional design, data governance, and institutional policies. Consequently, digital transformation creates sustainable value only when technology is purposefully integrated, adapted to learners, and supported by coherent institutional arrangements.

These mechanisms imply that effective digital transformation requires coordination among multiple levels and stakeholders, each facing distinct opportunities, challenges, and responsibilities. Table 2 outlines priorities for national authorities, higher education institutions, lecturers, students, and relevant partners.

Table 2. Opportunities, challenges, and implementation directions by stakeholder level

Level	Opportunities	Challenges	Priority directions	Stakeholders
National	Shared data and resources	Regional disparities; legal issues	Standards for infrastructure, data, learning resources; support disadvantaged areas	Government and ministries
Higher education institution	Digital learning ecosystem	Fragmented platforms; costs; limited personnel	Education-aligned strategy; integration; digital pedagogy support	Leadership, faculties, IT units
Lecturers	Diverse materials and feedback	Limited time and design expertise	Task-based training; recognition of outputs	Lecturers, faculties, support centers
Students	Flexible learning and autonomy	Device gaps; overload; AI dependency	Digital learning guidance, verification, privacy	Students, advisers
Partners	Platform and resource partnerships	Vendor lock-in	Transparent procurement; data portability	Institutions and enterprises

Source: Compiled by the author from OECD (2023), Prime Minister of Vietnam (2022), UNESCO (2023), and Miao and Holmes (2023).

Figure 1 and Table 2 demonstrate that investment in equipment without pedagogical redesign merely changes the medium, while data collection without governance can increase risks.

2.7. Implementation directions

At the national level, digital transformation in higher education should be treated as a program for capacity and quality development, not merely as a technology project. Following Decision No. 131/QD-TTg, infrastructure, accessibility, data interoperability, information security, and retention standards should be specified. Guidance on AI should cover tool evaluation, data protection, copyright, use disclosure, and user accountability. Policies should distinguish permissible uses, uses requiring disclosure, and unacceptable practices according to task objectives.

Investment mechanisms should prioritize institutions and learners with limited resources. Shared learning materials require clear licenses, quality standards, and adaptability to local contexts. Shared data must be accompanied by access controls and purpose limitations.

At the institutional level, each university should develop its strategy around educational objectives. Technology should be selected only after identifying the problem to be addressed. Institutions should review platform duplication, integration capacity, data ownership, life-cycle costs, and vendor-exit options. Performance should be evaluated against learning outcomes and user experience, rather than merely the number of accounts or uploaded resources.

Higher education institutions should establish instructional-design support units linking pedagogical, technological, library, data, and legal expertise. Professional development should focus on tangible outputs, such as redesigning courses or developing new assessments. Institutions should recognize the time invested in digital resource development and respect authors' rights.

For lecturers, the guiding principle is objectives first, technology second. Tools should be evaluated for educational value, accessibility, data collection practices, and contingency arrangements. In the AI era, assignments should involve professional scenarios, documented revision processes, and direct defense of work. When tools are used, students should explain how they were used and how outputs were verified.

For students, digital learning competence should be regarded as part of university-level competence. Orientation should address time management, academic information retrieval, source evaluation, privacy, collaboration, and responsible AI use. Institutions must also maintain support channels for devices, access, and data-related issues.

3. CONCLUSION AND RECOMMENDATIONS

3.1. Conclusions

The synthesis addresses the three research questions. First, digital technology changes lecturers' roles from predominantly delivering content to designing, coordinating, supporting, and assessing the learning process. Students gain greater autonomy over time, resources, and pace, but must develop self-regulation, verification skills, and responsibility for their work.

Second, technology broadens instructional formats to include online, blended, flipped, collaborative, and simulation-based learning. Learning materials, interaction, and feedback can be organized more continuously. Assessment shifts from reliance on a single final test toward multiple forms of process evidence. Generative AI requires institutions to reconsider assessment tasks, academic integrity, and ways to verify students' authentic competence.

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Third, Vietnamese higher education has opportunities to expand access, increase flexibility, share resources, and enhance international integration. These benefits do not automatically follow from purchasing equipment or deploying platforms; they depend on learning objectives, digital competencies, resource quality, technical support, data governance, and an innovation-oriented culture.

Transforming teaching approaches is a pedagogical and organizational process supported by technology. This study is limited by its reliance on secondary materials and the absence of empirical validation of the synthesized framework across specific institutional types, disciplines, or regions.

3.2. Recommendations

Public authorities should translate policy into standards for infrastructure, data, educational resources, accessibility, and quality assurance. AI guidance needs to clarify data protection, copyright, transparency in use, and accountability. Resources should prioritize disadvantaged institutions and learner groups.

Higher education institutions should align digital strategies with intended learning outcomes; integrate platforms; establish instructional-design support units; adopt data and AI governance rules; and recognize the work involved in producing digital resources. Digital initiatives should be evaluated using learning evidence and user experience, not usage metrics alone.

Lecturers should develop digital pedagogical, data, and ethical competencies. Assessment should emphasize reasoning processes, application, and the defense of work. Students need guidance in self-directed learning, source verification, privacy, copyright, and responsible AI use.

Further research should compare disciplines, institutional types, and regions; assess the long-term effects of blended learning, analytics, and AI; and examine experiences among students with differing access conditions. Empirical data would help validate Figure 1 and support more context-sensitive policy decisions.

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