



MANAGING THE DEVELOPMENT OF LECTURERS' ARTIFICIAL INTELLIGENCE COMPETENCE IN DISTANCE EDUCATION

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Abstract:

This study aims to establish a scientific basis and propose management directions for developing lecturers' artificial intelligence (AI) proficiency in distance education, thereby meeting the demands of educational innovation and digital transformation in higher education. It addresses a research gap: while existing literature largely focuses on digital literacy, AI proficiency, and the application of technology in teaching, the management of this specific competency development among lecturers in distance education environments has not yet been systematically studied. The study employs document analysis and synthesis combined with expert consultations to identify relevant competency components and management aspects. The findings reveal that lecturers' AI proficiency comprises six components and identify six key management areas: defining competency standards, assessing needs, planning development, organizing training, establishing a supportive environment, and evaluating outcomes. Based on these findings, the study proposes a management model based on a cycle linking competency standards, professional development, practical support, and evaluation. These results offer valuable insights for higher education institutions and distance education providers in formulating policies, training programs, and support mechanisms to enable lecturers to use AI effectively and responsibly.

Keywords: artificial intelligence; competence; lecturers; distance education; competence development management; digital transformation in education

1. Introduction

The rapid development of artificial intelligence (AI)—particularly generative AI tools—is driving significant changes in higher education. AI can assist instructors in designing learning materials, structuring learning activities, providing feedback, conducting assessments, analyzing data, and pursuing professional development. These capabilities are particularly significant for distance education, where the majority of teaching,

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interaction, and learner support takes place in a digital environment. However, the effectiveness of AI depends not only on instructors' access to and use of these tools but also on their ability to select, verify, and integrate the technology with pedagogical goals, while ensuring safe and responsible usage. Consequently, developing AI proficiency is becoming a new requirement for faculty members in distance education.

In Vietnam, this requirement is linked to the process of digital transformation in education. Decision No. 131/QĐ-TTg, dated January 25, 2022, issued by the Prime Minister, identifies the development of digital competencies among teaching staff as a key component of educational digital transformation, while also outlining directions for the increased application of new technologies in teaching and educational management (Prime Minister, 2022). Regarding higher education, Circular No. 26/2026/TT-BGDĐT establishes professional standards for university lecturers, emphasizing the need for professional development and the responsibility of higher education institutions to train and upskill their faculty (Ministry of Education and Training, 2026). These directives provide a foundation for higher education institutions to prioritize the development of lecturers' artificial intelligence (AI) proficiency, particularly within institutions offering distance education programs.

Recent studies in Vietnam have addressed the development of digital and AI competencies, as well as the application of AI in higher education. Phung Van On and Tran Tuan Anh (2026) proposed solutions to foster digital and AI competencies among faculty and students, emphasizing skill development and AI integration in teaching and research, while also ensuring digital ethics and responsibility. Research on online education indicates that AI is already being utilized for learning management, content personalization, chatbots, and learner data analytics; however, implementation faces numerous barriers related to technology, human resources, finance, governance, legal frameworks, and ethics. In practice, some higher education institutions have begun organizing AI training courses for faculty, highlighting the increasingly evident need to develop these competencies.

However, existing studies primarily focus on defining AI competencies, AI applications, or training solutions, whereas the management of the process of developing lecturers' AI proficiency—particularly in the context of distance education—has not yet been comprehensively or systematically researched. Lecturers' AI proficiency is not cultivated through a single training course; rather, it requires development through a continuous management process that encompasses defining competency standards, assessing needs, planning, organizing training, fostering a supportive environment for practice, and evaluating outcomes.

Addressing the aforementioned gap, this study focuses on answering the following questions:

- 1) What are the components of lecturers' artificial intelligence (AI) proficiency in distance education?
- 2) What activities are required to manage the development of this proficiency?

- 3) What management framework is suitable for the specific characteristics of distance education? The study employs methods of document analysis, synthesis, and comparison, combined with expert consultations.

The findings contribute to the theoretical framework regarding faculty development management in the era of artificial intelligence and provide a reference for higher education institutions in establishing competency standards, training programs, and support mechanisms for distance education lecturers.

2. Research methodology

This study employs a qualitative approach, combining document analysis and synthesis with expert consultation. Domestic and international literature was selected and analyzed across several thematic areas: faculty professional competence and its development; educators' digital and artificial intelligence (AI) competencies; AI applications in higher education; and distance education and faculty development management. Additionally, the study analyzes relevant policy documents concerning digital transformation in education and the development of higher education faculty.

Based on the literature synthesis, the study identifies the concepts and components of AI-related competence, as well as the elements involved in managing competence development within distance education. An initial management framework was developed and submitted for expert consultation to evaluate the suitability, comprehensiveness, and feasibility of its components and their interrelationships. Expert feedback was then synthesized to refine and finalize the proposed management framework.

The research process comprises five steps:

- 1) literature analysis;
- 2) conceptualization and definition;
- 3) identification of competency components and management content; (
- 4) development of the management model; and
- 5) expert consultation, adjustment, and finalization of the framework.

During the preparation of this article, the author utilized artificial intelligence tools to assist in creating the model and developing matrices for the presentation and analysis of the research content. The author bears full responsibility for the content, accuracy, and conclusions of the article.

3. Research results

3.1 The concept of lecturers' artificial intelligence usage competence in distance education

To formulate the concept of lecturers' artificial intelligence (AI) usage competence in distance education, this study draws upon the competence-based approach as well as

existing domestic and international research regarding lecturers' digital and AI competencies.

Competence is understood as the ability to mobilize and integrate knowledge, skills, attitudes, and personal attributes to effectively perform a task within a specific context. In the context of university lecturers, competence is viewed in relation to professional task requirements, encompassing the knowledge, skills, and attitudes necessary to effectively carry out teaching, research, and professional development activities (Nguyen & Pham, 2023). This approach demonstrates that competence is not merely manifested through "knowing" or "knowing how to do something"; more importantly, it lies in the ability to utilize personal resources to generate outcomes that align with professional requirements.

Against this backdrop, the digital competence of university lecturers is understood more broadly than merely the ability to use digital devices and software; it encompasses the capacity to leverage technology for teaching, research, communication, collaboration, professional development, and learner support. Bùi Trang Hương (2024) proposed a digital competence framework for Vietnamese university lecturers comprising dimensions such as foundational digital competence, teaching, scientific research, professional development, and supporting the development of learners' digital competence. Recent research by Lê Phước Sơn and Trần Thúy Hiền (2026) further proposed a reference framework integrating digital and artificial intelligence (AI) competencies for lecturers and administrators in higher education institutions, highlighting that AI competence is increasingly becoming a key component to be considered within the competency structure of higher education personnel.

Artificial Intelligence (AI) competency represents an evolution of digital competency, yet it is distinct from it. While digital competency emphasizes the general ability to use digital technologies, AI competency focuses on the capacity to understand, evaluate, utilize, and interact responsibly with AI systems. UNESCO defines an AI competency framework for teachers comprising 15 competencies across five domains—human-centered mindset, AI ethics, AI foundations and applications, AI pedagogy, and AI for professional development—with competencies structured across three levels: awareness, deepening, and creation (Miao & Cukurova, 2024).

Based on this approach, AI literacy is understood as the capacity to mobilize and integrate knowledge, skills, attitudes, values, and judgment to select, utilize, evaluate, and incorporate AI tools or systems into the performance of specific tasks in a manner that is appropriate, effective, safe, and responsible. This perspective emphasizes that AI literacy extends beyond the mere operation of tools; it encompasses the ability to evaluate AI-generated outputs, recognize limitations and risks, uphold ethical standards, and make decisions aligned with professional objectives. This view aligns with UNESCO's framework for developing teachers' AI competencies by combining knowledge, skills, and values while ensuring the central role and responsibility of humans (Miao & Cukurova, 2024).

In distance education, lecturers primarily carry out their professional activities within a digital environment, encompassing tasks such as designing and delivering learning materials, facilitating interaction, supporting independent learning, monitoring progress, and conducting assessment and evaluation. Consequently, the use of artificial intelligence by lecturers must be aligned with these specific tasks. Recent domestic studies have also begun to emphasize the competencies associated with the use of artificial intelligence in teaching, research, and other academic activities undertaken by university lecturers (Lê Phước Sơn & Trần Thúy Hiền, 2026; Lữ Quốc Vinh *et al.*, 2026). Based on the above analysis, this study defines the competence of lecturers in using artificial intelligence within distance education as:

This refers to an instructor's capacity to mobilize and comprehensively apply their knowledge, skills, attitudes, values, and professional judgment to select, utilize, evaluate, and integrate artificial intelligence tools and systems into teaching, learner support, assessment, and professional development within a distance education environment—doing so in a manner that is appropriate, effective, safe, and responsible.

This concept comprises three dimensions. The first is the resource dimension, encompassing knowledge, skills, attitudes, values, and professional judgment. The second is the action dimension, demonstrated by the ability to select, use, evaluate, and integrate artificial intelligence into professional tasks. The third is the contextual dimension, defined by the distance education environment, where teaching, interaction, learner support, and assessment are primarily conducted via digital platforms.

Thus, in this study, an instructor's competence in using artificial intelligence within distance education is approached as an integrated professional competency—linked to professional duties and capable of continuous development—rather than merely a skill for using specific artificial intelligence tools. This serves as the foundation for the study to further identify the constituent elements of this competence and the content for managing its development in a way that aligns with the specific characteristics of distance education.

3.2 Components of AI proficiency

The components of AI proficiency for lecturers are determined by synthesizing and comparing existing AI competency frameworks for educators. UNESCO identifies five dimensions: human-centered mindset, AI ethics, AI foundations and applications, AI pedagogy, and professional development (Miao & Cukurova, 2024). A review by Zhou *et al.* (2025) also identifies core competency groups related to awareness, application, evaluation, ethics, and professional development. These studies indicate that AI proficiency among educators requires an integrated approach, extending beyond mere tool-usage skills.

Based on this, the present study adopts, integrates, and adapts these components to the specific professional context of lecturers and the distance education environment, while also referencing domestic research on digital and AI competencies for university lecturers (Lê Phước Sơn & Trần Thúy Hiền, 2026). The results identify six components:

Table 1: Matrix of Components of Lecturers' Artificial Intelligence Competence in Distance Education

Competence Component	Core Content	Manifestations in Distance Education	References
1. Knowledge and Awareness of Artificial Intelligence	Understanding the concepts, characteristics, capabilities, limitations, and basic operating principles of artificial intelligence (AI); recognizing the role and impact of AI in education	Identifying the capabilities and limitations of AI when used in teaching, learner support, and the management of learning activities in distance education.	Miao & Cukurova (2024); Mikeladze <i>et al.</i> (2024); Zhou <i>et al.</i> (2025)
2. Skills in Selecting and Using Artificial Intelligence	Applying knowledge and skills to select appropriate AI tools, design prompts, and effectively utilize AI.	Selecting and using AI to develop learning materials, prepare instructional content, facilitate interaction, and address professional tasks in online learning environments.	Miao & Cukurova (2024); Zhou <i>et al.</i> (2025)
3. Integration of Artificial Intelligence into Teaching Activities	Integrating AI appropriately with teaching objectives, content, methods, and organizational forms of instruction.	Using AI to design lectures, develop digital learning materials, design learning activities, enhance interaction, and personalize support for distance learners.	Miao & Cukurova (2024); Lim <i>et al.</i> (2024)
4. Evaluation and Professional Judgment in the Use of Artificial Intelligence	Evaluating the accuracy, reliability, and appropriateness of AI-generated outputs; applying professional judgment to select, modify, or reject AI-generated results.	Verifying AI-generated content before use; evaluating the appropriateness of AI for supporting learners and conducting assessment and evaluation in distance education.	Mikeladze <i>et al.</i> (2024); Zhou <i>et al.</i> (2025)
5. Ethics, Safety, and Responsibility in the Use of Artificial Intelligence	Applying ethical values and principles; ensuring privacy, data security, copyright protection, fairness, and transparency in the use of AI.	Protecting learner data; using AI responsibly in teaching, learner support, and assessment; maintaining transparency regarding the use of AI.	Miao & Cukurova (2024); UNESCO (2023)
6. Professional Development with the Support of Artificial Intelligence	Using AI for self-directed learning, research, knowledge updating, reflection, and improvement of professional practice.	Leveraging AI to develop learning materials, support scientific research, update professional knowledge, share practices, and improve teaching practices in distance education.	Miao & Cukurova (2024); Zhou <i>et al.</i> (2025)

Source: Compiled, adapted, and modified by the author based on Miao and Cukurova (2024), Mikeladze *et al.* (2024), Lim *et al.* (2024), Zhou *et al.* (2025), and UNESCO (2023).

3.3. Aspects of managing the development of AI usage competencies

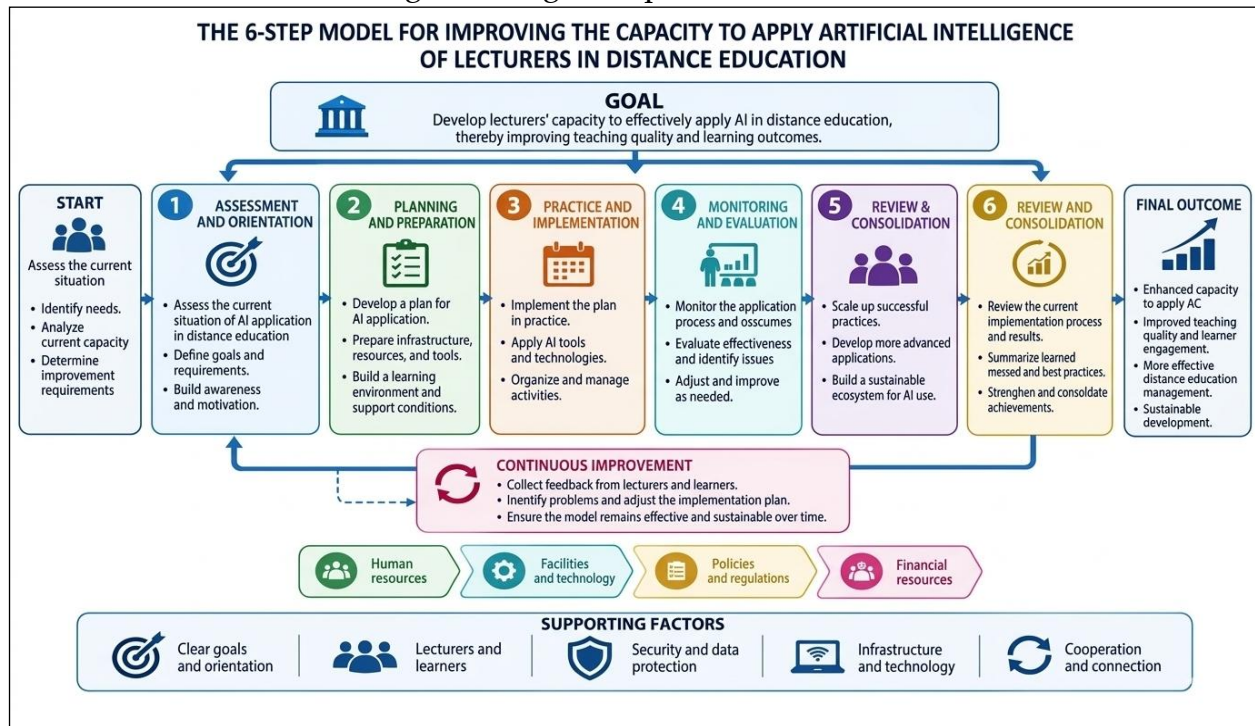
Managing the development of lecturers' artificial intelligence (AI) usage competencies in distance education is a continuous process aligned with professional requirements and the educational institution's digital transformation strategy. Drawing upon the UNESCO AI competency framework (Miao & Cukurova, 2024) and DigCompEdu (Redecker & Punie, 2017), this study identifies six key management aspects:

- 1) **Defining AI competency standards:** Institutional leadership collaborates with functional departments and academic faculties/departments to define the components and proficiency levels of AI competencies relevant to lecturers' duties—including teaching, assessment, learner support, research, and the ethical and safe use of AI.
- 2) **Needs assessment:** Functional departments and academic faculties/departments collaborate with lecturers to assess current competency levels and identify the gap between existing competencies and the required standards, thereby establishing a basis for determining professional development needs (Redecker & Punie, 2017).
- 3) **Developing a development plan:** Leadership at the educational institution directs specialized units to formulate a plan covering objectives, target groups, content, roadmaps, formats, and resources for AI competency development, ensuring alignment with the institution's overall development strategy.
- 4) **Organizing training:** Functional departments, faculties/departments, and core faculty members organize training focused on practical application, linked to real-world tasks such as designing learning materials, teaching, assessment, and using AI to support learners (Miao & Cukurova, 2024).
- 5) **Providing support and building a professional community:** Leadership establishes support mechanisms; faculties/departments and core faculty members organize activities for sharing, consulting, piloting, and peer learning, thereby helping to sustain and further develop competencies after the initial training.
- 6) **Monitoring and evaluation:** Leadership, in collaboration with functional departments and faculties/departments, assesses the extent to which faculty members meet standards and their ability to apply AI, based on tangible outputs and practical activities; the results are used to adjust the competency development plan and content.

Thus, these management activities are carried out through a sequence of "defining standards – assessing needs – planning – organizing training – supporting the community – monitoring and evaluation," wherein the institution's leadership plays the role of providing direction and coordination; functional departments offer advice and organization; faculties/departments handle implementation; core faculty members provide support; and individual faculty members are the direct agents in developing and applying AI competencies.

3.4. Model for managing the development of lecturers' artificial intelligence usage competence in distance education

Table 2: Model for managing the development of lecturers' artificial intelligence usage competence in distance education



The proposed model comprises inputs, context, six management activities, and outputs, operating under a continuous improvement mechanism. This structure draws upon the digital competence development frameworks of UNESCO and DigCompEdu while incorporating the PDCA cycle for quality management and improvement (Deming, 1986). The inputs consist of learner needs; the training institution's strategies and objectives; and resources such as personnel, finance, technological infrastructure, learning materials, and data. The context encompasses policies on digital transformation in education, the specific characteristics of distance learning, and the rapid advancement of AI.

Within this framework, institutional-level administrators (principals/directors and functional departments) provide direction, issue policies, allocate resources, and oversee monitoring; faculties and departments handle organization, coordination, and support; core faculty members act as advisors and peer mentors; and individual lecturers are the active participants responsible for their own professional development.

The management process comprises six steps:

- 1) defining AI competency standards;
- 2) assessing needs;
- 3) formulating development plans;
- 4) organizing training;

- 5) providing support and building professional communities; and
- 6) monitoring and evaluation.

Evaluation results feed back into the standard-setting and planning stages, creating a continuous "Plan-Do-Check-Act" improvement cycle. This approach aligns with management principles based on feedback and continuous improvement.

The ultimate outcome is a faculty capable of using AI safely, effectively, and responsibly—applying it to teaching, learner support, and research—thereby contributing to the enhanced quality of distance education.

3.5. Enabling conditions

For the management model regarding the development of lecturers' AI proficiency in distance education to operate effectively, the educational institution must ensure a synchronized set of conditions covering policies, competency standards, personnel, infrastructure, resources, and improvement mechanisms.

First, regarding policies and management mechanisms, the institution's leadership and relevant functional departments need to establish strategic directions, regulations, and incentive mechanisms for AI adoption, while simultaneously integrating AI competency development into digital transformation strategies and staff development plans. Policies should guide AI usage based on principles of effectiveness, safety, ethics, and responsibility (Miao & Cukurova, 2024).

Second, regarding competency standards and assessment systems, the departments responsible for human resources and academic affairs must collaborate with faculties and academic departments to define specific AI competency standards, assessment criteria, and evidence requirements tailored to the lecturers' roles. The UNESCO AI competency framework can serve as a reference for developing training content and assessing levels of competency development (Miao & Cukurova, 2024).

Third, regarding personnel and management capabilities, the leadership of educational institutions and their faculties or departments must develop a core team of lecturers with AI proficiency to guide, advise, and support their colleagues; simultaneously, they must enhance the capacity of management staff to direct, organize, and oversee the implementation of AI.

Fourth, regarding technology and data infrastructure, institutional leadership—in collaboration with IT units and faculties or departments—must ensure that distance learning platforms, AI tools, data, and digital learning materials are stable, secure, and capable of meeting teaching requirements and supporting AI competency development.

Fifth, regarding resources and the professional environment, institutional leadership needs to secure funding, time, and the necessary conditions for professional development participation; faculties and departments should establish communities of practice where lecturers can share experiences, provide mutual support, and learn from one another. Digital competency development must be situated within an environment that fosters continuous professional support and growth (Redecker & Punie, 2017; UNESCO, 2018).

Fifth, regarding monitoring, feedback, and improvement, the training institution's leadership—in collaboration with functional departments and academic faculties/departments—must utilize assessment results to adjust competency standards, training content, support methods, and resource allocation. This ensures the model operates according to the Plan-Do-Check-Act (PDCA) cycle, thereby maintaining adaptability to the rapid evolution of AI and the demands of remote training (Deming, 1986).

In summary, these conditions constitute the assurance system for the model, wherein the institution's leadership provides direction and coordination; functional departments offer advisory support, organization, and oversight; faculties/departments handle direct implementation; and core instructors and professional communities play roles in supporting, sharing, and disseminating AI proficiency.

4. Discussion

The research findings indicate that the competence of lecturers in using artificial intelligence for distance education should be approached as an integrated professional competency; it encompasses not only the ability to use tools but also aspects related to instruction, assessment, learner support, safety assurance, and professional development. These results align with UNESCO's perspective on teachers' AI competencies, which emphasizes the integration of technological, pedagogical, and ethical capabilities alongside professional development (Miao & Cukurova, 2024).

Consultation results show a general consensus among experts regarding the seven components of AI competence: awareness and understanding of AI; tool selection and usage; AI integration in distance teaching; AI application in assessment; leveraging AI and data to support learners; safe, ethical, and responsible AI use; and AI utilization for professional development. Notably, the experts emphasized the need to align AI competence with the specific characteristics of distance education—particularly regarding the organization of online instruction, the development of digital learning materials, learner support, and assessment within digital environments.

Regarding management, experts agree that AI competency development should be structured as a continuous process rather than being limited to isolated training sessions on tool usage. Based on expert consultations, the study identifies seven management components: defining competency standards; assessing needs; planning; organizing training; fostering an environment and professional community; evaluating outcomes; and ensuring continuous improvement. This approach aligns with the direction of developing educators' digital competence through continuous professional development (Redecker & Punie, 2017).

A notable insight from expert consultations is the need to clearly define the roles of various stakeholders within the model. Specifically, institutional leadership provides strategic direction, establishes policies, and secures resources; functional departments offer advisory and coordination support; faculties and departments oversee

implementation; core faculty members provide support and share experiences; and individual lecturers apply the skills and engage in self-directed competency development. This delineation allows the model to shift from merely managing training activities to managing an ecosystem for AI competency development.

Overall, expert feedback reinforces the relevance, comprehensiveness, and feasibility of the proposed management framework while clarifying the interrelationships among competency standards, development needs, training, support, evaluation, and improvement. However, as the study is currently based on literature analysis and expert consultation, the proposed framework requires empirical validation within higher education institutions offering distance learning programs.

5. Conclusion

As artificial intelligence (AI) drives significant changes in the organization and delivery of distance education, developing lecturers' AI proficiency has emerged as a new requirement in workforce management. Based on a review of literature and expert consultations, this study identifies six components of lecturers' AI proficiency in distance education: (1) AI knowledge and awareness; (2) skills in selecting and using AI; (3) AI integration in teaching activities; (4) professional judgment and evaluation when using AI; (5) ethics, safety, and responsibility in AI usage; and (6) AI-supported professional development.

Accordingly, the study proposes an AI proficiency development management framework comprising seven elements: defining competency standards, assessing needs, planning, organizing training, fostering an environment and professional community, evaluating outcomes, and ensuring continuous improvement. The framework also delineates the roles of various stakeholders—ranging from institutional leadership, functional departments, and academic faculties/departments to core faculty and individual lecturers—thereby linking management direction, implementation, professional support, and self-directed competency development. Theoretically, the study contributes to the body of knowledge regarding the management of lecturers' AI proficiency development, particularly within the context of distance education—a field that has received limited attention from a management perspective. Practically, the proposed framework can serve as a reference for higher education institutions in establishing AI competency standards, designing training programs, organizing professional support, and developing faculty evaluation mechanisms.

As the current research is limited to document analysis and expert consultation, future studies should empirically validate the competency framework and management model within distance education institutions, develop a specific set of evaluation criteria, and investigate the impact of AI proficiency on teaching quality and learner outcomes.

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Conflict of Interest Statement

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References

- Basilotta-Gómez-Pablos, V., Matarranz, M., Casado-Aranda, L.-A., & Otto, A. (2022). Teachers' digital competencies in higher education: A systematic literature review. *International Journal of Educational Technology in Higher Education*, 19, Article 8. <https://doi.org/10.1186/s41239-021-00312-8>
- Brandão, A., Pedro, L., & Zagalo, N. (2024). In search of artificial intelligence literacy in teacher education: A scoping review. *Computers and Education: Open*, 6, 100169. <https://doi.org/10.1016/j.caeo.2024.100169>
- Bùi Thị Hương. (2024). Đề xuất khung năng lực số của giảng viên đại học Việt Nam trong bối cảnh Cách mạng công nghiệp 4.0. *Tạp chí Giáo dục*, 24(24), 8–13.
- Bộ Giáo dục và Đào tạo. (2025). *Thông tư số 02/2025/TT-BGDĐT ngày 24 tháng 01 năm 2025 quy định khung năng lực số cho người học*.
- Bộ Giáo dục và Đào tạo. (2026a). *Thông tư số 18/2026/TT-BGDĐT ngày 27 tháng 03 năm 2026 ban hành khung năng lực số đối với giáo viên, cán bộ quản lý cơ sở giáo dục mầm non, phổ thông và giáo dục thường xuyên*.
- Bộ Giáo dục và Đào tạo. (2026b). *Thông tư số 26/2026/TT-BGDĐT ngày 09 tháng 04 năm 2026 quy định chuẩn nghề nghiệp giảng viên đại học*.
- Deming, W. E. (1986). *Out of the crisis*. Massachusetts Institute of Technology, Center for Advanced Engineering Study. <https://doi.org/10.7551/mitpress/11457.001.0001>

- Dogan, N. A., & Agacli Dogan, N. (2025). Artificial intelligence professional development: A systematic review of TPACK, designs, and effects for teacher learning. *Professional Development in Education*, 51(3), 519–546. <https://doi.org/10.1080/19415257.2025.2454457>
- Lê Phước Sơn, & Trần Thúy Hiền. (2026). Đề xuất khung tham chiếu tích hợp năng lực số và năng lực trí tuệ nhân tạo cho giảng viên, cán bộ quản lý cơ sở giáo dục đại học tại Việt Nam. *Tạp chí Giáo dục*, 26(9), 21–27.
- Lữ Quốc Vinh, Nguyễn Ngọc Chi Lan, Nguyễn Ngọc Phương Thảo, & Nguyễn Minh Thư. (2026). Năng lực thiết kế học tập thích ứng với trí tuệ nhân tạo của giảng viên: Nghiên cứu tại Đại học Cần Thơ. *Tạp chí Giáo dục*, 26(Đặc biệt 1), 329–334.
- Miao, F., & Cukurova, M. (2024). *AI competency framework for teachers*. UNESCO. Retrieved from <https://www.unesco.org/en/articles/ai-competency-framework-teachers>
- Mikeladze, T., Meijer, P. C., & Verhoeff, R. P. (2024). A comprehensive exploration of artificial intelligence competence frameworks for educators: A critical review. *European Journal of Education*, 59. <https://doi.org/10.1111/ejed.12663>
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054. <https://doi.org/10.1111/j.1467-9620.2006.00684.x>
- Norhagen, S. L., Krumsvik, R. J., & Røkenes, F. M. (2024). Developing professional digital competence in Norwegian teacher education: A scoping review. *Frontiers in Education*, 9. <https://doi.org/10.3389/feduc.2024.1363529>
- O'Connor, J., Garbett, G., Cui, V., Wheatcroft, L., Vuong, L. Q., & Minh, T. K. (2026). Supporting the digital transformation of teacher education in Vietnam: Developing and evaluating a Teacher Educators' Digital Hub (TEDH). *Practice: Contemporary Issues in Practitioner Education*. <https://doi.org/10.1080/25783858.2026.2647741>
- Pedersen, C., Aagaard, T., & Daus, S. (2024). Profiling teacher educators' strategies for professional digital competence development. *Teachers and Teaching: Theory and Practice*, 30(4). <https://doi.org/10.1080/13540602.2024.2336612>
- Phùng Văn Ổn, & Trần Tuấn Anh. (2026). Phát triển năng lực số và trí tuệ nhân tạo cho giảng viên và sinh viên trong đào tạo đại học. *Tạp chí Khoa học Tài chính - Ngân hàng*, (17), 46. <https://www.vjol.info.vn/tapchikhoahoctaichinhnganhangHN/vi/article/view/148690>
- Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. Publications Office of the European Union. <https://doi.org/10.2760/159770>
- Thủ tướng Chính phủ. (2020). Quyết định số 749/QĐ-TTg ngày 03 tháng 06 năm 2020 phê duyệt Chương trình Chuyển đổi số quốc gia đến năm 2025, định hướng đến năm 2030.
- Thủ tướng Chính phủ. (2022). Quyết định số 131/QĐ-TTg ngày 25 tháng 01 năm 2022 phê duyệt Đề án “Tăng cường ứng dụng công nghệ thông tin và chuyển đổi số trong giáo dục và đào tạo giai đoạn 2022–2025, định hướng đến năm 2030”.

- UNESCO. (2018). *UNESCO ICT competency framework for teachers* (Version 3). UNESCO. Retrieved from https://teachertaskforce.org/sites/default/files/2020-07/ict_framework.pdf
- UNESCO. (2023). *Guidance for generative AI in education and research*. UNESCO. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000386693>
- Uerz, D., Volman, M., & Kral, M. (2018). Teacher educators' competences in fostering student teachers' proficiency in teaching and learning with technology: An overview of relevant research literature. *Teaching and Teacher Education*, 70, 12–23. <https://doi.org/10.1016/j.tate.2017.11.005>
- Zhou, T., Tondeur, J., & Howard, S. (2025). AI competency frameworks for teachers: A systematic review. In *Proceedings of EdMedia + Innovate Learning* (pp. 636–642). Association for the Advancement of Computing in Education. Retrieved from https://www.researchgate.net/publication/391862779_AI_Competency_Frameworks_for_Teachers_A_Systematic_Review