Developing digital competencies for teachers in the context of comprehensive digital transformation in education and training in Vietnam

Dr. Nguyen Thi La
Institute of Language - Culture - International Studies, Thanh Do University
M.A. Nguyen Thi Hoan Cam
Thanh Am Junior High School, Hanoi

Abstract: *The rapid advancement of the Industrial Revolution 4.0 and the accelerated implementation of the national digital transformation strategy are placing urgent demands on the development of digital competencies among teachers, recognizing this as a critical factor in realizing the goal of comprehensive digital transformation in education and training in Vietnam. Teachers' digital competencies extend beyond the ability to use technological tools in teaching; they also encompass the capacity to design, organize, and assess educational processes in digital environments, leverage learning analytics, and apply artificial intelligence (AI) to enhance the quality of teaching and learning and personalize these activities. Teachers' digital competencies in Vietnam have shown notable improvement in recent years. However, the development process continues to face significant limitations and challenges, including disparities in digital readiness across regions and educational levels; insufficient depth in digital pedagogy, data mining, and AI application; and institutional, infrastructural, professional development, and career-motivational constraints. Conducting systematic research on the theoretical foundations, policy context, and current situation, and proposing comprehensive and feasible solutions to enhance teachers' digital competencies is therefore an urgent requirement for successful implementation of comprehensive digital transformation in education and training in Vietnam.*

Keywords: *Digital competence; teachers; digital transformation in education and training; digital competence framework; education policy; Vietnam..*

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1. Introduction

Digital transformation has become a dominant trend, exerting profound impacts across all areas of socio-economic life, of which education and training are among the most directly and comprehensively affected sectors. Digital technologies, big data, and artificial intelligence (AI) not only expand access to knowledge but also

fundamentally transform organization of teaching and learning, school governance, and assessment of educational outcomes. Both international and domestic practices demonstrate that digital transformation in education is no longer merely a technical option but has become an inevitable requirement for improving the quality of human resources and enhancing national competitiveness in the digital era.

In Vietnam, the digital transformation of education and training has been increasingly deployed in closely link to the need for fundamental and comprehensive educational reform. The Party and the State have issued numerous major policies and strategic directives on digital transformation, most notably the Politburo's Resolution No. 71-NQ/TW dated August 22, 2025, on breakthrough development of education and training, and the Government's Resolution No. 281/NQ-CP dated September 15, 2025, promulgating the Government's Action Program to implement the Politburo's Resolution No. 71-NQ/TW. On this basis, many educational institutions have initially applied digital technologies in teaching, management, and provision of educational services. Online learning platforms, digital learning repositories, and online learning management and assessment systems have become increasingly widespread. However, practice also shows that digital transformation in education has not yet progressed evenly or deeply. In many cases, digital transformation has remained limited to digitization of tools and processes, while teaching models, pedagogical methods, and the organization of educational activities still largely reflect traditional approaches. This situation underscores the need to view digital transformation in education as a comprehensive transformation process involving not only technology but also human factors, organizational structures, and the operational mechanisms of the educational system.

Within this transformation process, the teaching workforce plays the most central and decisive role. Teachers are the key actors who directly design, organize, and implement teaching and learning activities, while also guiding learners to adapt and develop in a digital environment. Both theory and practice have demonstrated that, regardless of the level of investment in technological infrastructure and platforms, digital transformation in education cannot achieve substantive effectiveness if teachers lack the competence to integrate digital technologies into their professional activities. Experiences from large-scale online teaching in recent years have clearly revealed a gap between the demands of digital transformation and the actual competence of a considerable proportion of teachers. The core issue lies in the digital competence of the teaching workforce. Digital competence is not merely the ability to use technology or teaching software but rather a comprehensive set of professional competencies associated with digital environment, including digital pedagogical competence in designing, organizing, and assessing teaching and learning; competence in utilizing data and applying artificial intelligence to improve quality and personalize learning; competence in participating in digital professional communities and engaging in continuous professional development; as well as competence in ensuring digital safety, ethics, and culture in education. As digital transformation in education is increasingly defined as comprehensive, universal, and closely linked with AI, the requirements for teachers' digital competence have likewise become more comprehensive and demanding, far exceeding the traditional view of technology as merely a supporting tool.

However, the digital competence of the teaching workforce in Vietnam currently remains uneven across regions, educational levels, and types of educational institutions. A number of teachers, particularly in major

urban areas and pioneering educational institutions, have proactively adopted new technologies and gradually developed digital pedagogical thinking. Nevertheless, teachers in many localities still use technology primarily at a basic level, while their more advanced competencies - such as designing digital learning experiences, using learning data, and applying artificial intelligence in teaching - remain limited. This disparity not only affects educational quality but also risks widening the digital divide and increasing inequality in access to learning opportunities.

From a governance and policy perspective, a noteworthy paradox can be identified: although digital transformation in education and training has been recognized as a long-term strategic priority, the development of digital competence among teachers - the key actors responsible for implementing this transformation - has not yet been carried out systematically, comprehensively or closely aligned with mechanisms for training, professional development, evaluation, and career advancement. Teachers' digital competence is still regarded as a supplementary requirement rather than a core component of professional competence in the new context.

Given this reality, systematically studying the development of teachers' digital competence in the context of Vietnam's comprehensive digital transformation of education and training is an urgent requirement, both theoretically and practically. Research on this topic not only clarifies the concept and structure of teachers' digital competence but also situates it within the broader policy context, implementation conditions, and long-term educational development requirements. On this basis, this article focuses on addressing the following research questions: (1) How should the digital competence of the teaching workforce be conceptualized and structured in the context of the comprehensive digital transformation of education and training in Vietnam? (2) What achievements, limitations, and underlying causes characterize the current development of digital competence among Vietnamese teachers? and, (3) What solutions are needed to develop teachers' digital competence in a comprehensive and feasible manner, thereby contributing to the success of the comprehensive digital transformation of education and training in the coming period?

2. Theoretical foundations of teachers' digital competence

2.1. Concept and structure of teachers' digital competence

Around the world, research on teachers' digital competence has been pursued relatively early and has received increasing interest as digital technologies have profoundly influenced education. At the international level, one of the most influential reference frameworks is the UNESCO ICT Competency Framework for Teachers (ICT-CFT), one of the earliest and most widely influential reference frameworks, updated to Version 3 in 2018. This identifies six competency domains (understanding curriculum and assessment, pedagogical methods, technology application, classroom organization and management, professional development, and teachers' role within the community), associated with three levels of ICT utilization (knowledge acquisition, knowledge application, and knowledge creation). It conceptualizes teachers' ICT competence as the integration of technological knowledge, pedagogical skills, and subject content (UNESCO, 2018). The ICT-CFT has been widely used as a guiding tool for developing teacher training and retraining programs and as a framework for assessment in numerous quantitative research studies.

In addition, the European Framework for the digital competence of educators (DigCompEdu), published by the European Commission in 2017, is another significant

reference framework. This framework defines six competence areas: learner engagement, digital resources, teaching, assessment, empowering learners, and facilitating learners' development of digital competence (Redecker, 2017). DigCompEdu also proposes six proficiency levels (ranging from "newcomer" to "pioneer") and has been further developed into self-assessment tools and large-scale surveys measuring teachers' digital competence across many European countries.

Chinen (2025) systematized digital competence and skills frameworks for teachers at global, regional, and national levels. Based on this analysis, the study proposed the development of a competence framework system consisting of 16 competence domains, including four domains that directly focus on digital pedagogical competence: (1) Teaching; (2) Assessment and feedback; (3) Digital content creation; and (4) Personalized learning (subdivided into 17 specific competencies).

In Vietnam, research on teachers' digital competence emerged later but has received increasing attention and development. Several studies have analyzed competence frameworks and proposed their application in the Vietnamese context. Hung and Hoa (2025) provided an overview of the development context of digital competence in Vietnam, analyzed policies promoting online education, and proposed core digital competence groups for teaching and learning in digital environments, including competence in platform utilization, digital learning resource design, online interaction organization, digital assessment, and ensuring digital safety and ethics. Thanh et al. (2025) analyzed eight prominent international digital competence frameworks for teachers, emphasizing ICT-CFT and DigCompEdu, and proposed suggestions for structuring a digital competence framework for Vietnamese teachers. These include competence groups related to technology, digital pedagogy, assessment, learner support, and professional development.

Overall, both international and domestic studies have reached consensus on several core points: (1) Teachers' digital competence is an essential component of professional competence in the context of digital education; (2) Digital competence is not synonymous with technological skills alone but also encompasses digital pedagogy, assessment, data literacy, ethics, and professional development; and, (3) The structure of digital competence is increasingly expanding in response to the demands of personalized learning, AI application, and the development of learners' digital competence. However, concretizing the concept and structure of teachers' digital competence must be situated within the specific institutional context, policies and implementation conditions for each country, including Vietnam.

Building upon the aforementioned theoretical approaches and research findings, digital competence can be understood as a set of knowledge, skills, attitudes, and values that enable individuals to use digital technologies effectively, creatively, and responsibly in learning, work, and social life. Regarding the concept of teachers, from a legal perspective, Article 66 of the 2019 Law on Education stipulates that teachers are those who perform teaching and educational duties in educational institutions (National Assembly, 2019). Based on the concept of "teachers," the term "teaching workforce" is commonly used in official documents, policies, and academic research in Vietnam to refer to the collective body of teachers working within the education system, organized according to educational levels, training qualifications, and types of educational institutions, and operating under the unified management of the State.

Consistent with the aforementioned approaches and interpretations, the digital competence of the teaching workforce can be broadly understood as teachers' ability to effectively integrate digital technologies into

their professional activities. This competence is reflected in their capacity to design, organize, evaluate, and adjust the teaching and learning process; participate in the governance and development of digital educational environments; and support learners in forming and developing their digital competence in a safe, creative, and responsible manner. Accordingly, teachers' digital competence can be structured into several fundamental competence groups, including: (1) Competence in using and developing digital resources and learning environment; (2) Competence in designing, organizing, and assessing teaching and learning in digital environment; (3) Competence in using data and digital tools (including AI) to personalize and enhance the quality of teaching and learning; (4) Competence in participating in professional communities and engaging in professional development in digital spaces; and, (5) Competence in ensuring digital safety, security, ethics, and digital culture in interactions with learners and colleagues.

2.2. The importance of developing teachers' digital competence in the context of comprehensive digital transformation of education and training in Vietnam

This importance is reflected across multiple dimensions, ranging from the implementation of policies and strategic directives to innovation in teaching practices, ensuring educational equity, and enhancing the adaptability of the education system. Specifically:

First, in implementing policies and achieving strategic objectives for digital transformation in education and training, developing teachers' digital competence is a critical step in translating these macro-level policies and directives into concrete outcomes at the institutional level. The Politburo's Resolution No. 71-NQ/TW dated August 22, 2025, on breakthrough development of education and training, clearly identifies key objectives such as "digital education," "digital citizens," and "comprehensive and universal digital transformation, with strong application of digital technologies and AI in education and training." However, these objectives cannot become reality merely through issuance of programs, initiatives, or infrastructure investments. They can only be effectively realized when teachers possess sufficient competence to design curricula, organize teaching and learning activities, conduct assessments, and support learners in digital environments. Therefore, teachers' digital competence is regarded as the central "link" in the practical implementation of digital transformation policies.

Second, in relation to innovating teaching models, teachers' digital competence determines their ability to effectively utilize the digital ecosystem, including learning management systems (LMS), digital learning resources, virtual classrooms, interactive tools, simulations, online assessment tools, and learning data analytics. When teachers possess strong digital competence, they can flexibly integrate face-to-face, online, and blended learning modalities and apply active teaching methods in the digital environment. This not only improves the quality of teaching and learning but also enables teachers to proactively guide and support learners in developing their own digital competence. Conversely, if teachers' digital competence remains limited, digital transformation efforts are likely to result in superficial digitization, in which online classes become mere replicas of traditional classrooms, thereby undermining public trust in digital transformation in education.

Third, to ensure equity, narrow the digital divide, and strengthen integration in education, disparities in digital infrastructure, socio-economic conditions, and technological application capacity across regions, educational levels, and types of educational institutions pose a risk of significant inequalities in educational opportunities and quality. In this context, developing teachers'

digital competence serves as a critical lever for narrowing the digital divide. When teachers in disadvantaged areas possess strong digital competence, they can leverage online teaching platforms, open educational resources, and online professional communities to partially compensate for limitations in physical infrastructure, thereby enabling students to access higher-quality knowledge and learning services. At the same time, a more evenly distributed level of digital competence among teachers across different regions also constitutes an important condition for the education and training system to strengthen collaboration, resource sharing, and deeper participation in regional and international education networks. Conversely, if teachers in disadvantaged areas have limited digital competence, the digital divide in education will continue to widen, undermining the goals of equity, inclusiveness, and international integration established by the Party and the State.

Fourth, in terms of teachers' professional development and enhancing their adaptability of the education system in the AI era, the role of teachers is shifting significantly from knowledge transmitters to designers, facilitators, and managers of the learning process, supporting learners in developing comprehensive competencies. Digital competence constitutes one of the foundational pillars enabling teachers to fulfill this transformation. Teachers with strong digital competence can proactively update their knowledge, participate in open online courses, connect, and share within digital professional communities, co-develop digital learning resources, utilize AI tools, and analyze data to improve teaching effectiveness. This not only enables teachers to adapt to rapid changes in their profession and expand opportunities for personal and professional growth, but also enhances the status, credibility, and attractiveness of the teaching profession in society.

3. Research approach and methodology

3.1. Research approach

(1) Competency-based approach: the author adopts the competency-based approach as its foundational perspective. Accordingly, competence is understood as a combination of knowledge, skills, attitudes, and values, reflected in the ability to effectively perform tasks in specific contexts. When applied to the study of teachers' digital competence, the article goes beyond examining the ability to use technological tools and instead emphasizes the competence to integrate digital technologies into the entire process of teaching, assessment, classroom management, and professional development, while also supporting learners in forming and developing their own digital competence.

(2) System-policy approach: teachers' digital competence is viewed as a component within the broader system of digital transformation in education and training, influenced simultaneously by multiple factors, including the policies and directives of the Party and the State; strategies, programs, and initiatives of the education sector; digital infrastructure and ecosystems; school governance mechanisms; financial and human resources; digital culture; and learners' educational needs. Therefore, the development of teachers' digital competence must be examined in relation to resolutions, action programs, and legal documents concerning national digital transformation and digital transformation in education and training. This approach enables the analysis of teachers' digital competence not solely from an individual perspective but within the dynamic interaction between individuals and their institutional and policy environments.

(3) Comparative approach linked to practice: international teacher digital competence frameworks (such as ICT-CFT and DigCompEdu) are used as reference points for comparison with existing

regulations, orientations, and proposed digital competence frameworks in the Vietnamese context. On that basis, the authors identify similarities, differences, and competence components that may be lacking or insufficiently emphasized in policy design and practical implementation.

3.2. Research methods

Based on the aforementioned approaches, the author primarily employs qualitative research methods. The main methods include literature review and synthesis, policy analysis, comparative analysis, and secondary data analysis.

(1) *Literature analysis and synthesis:* the authors involve collecting, selecting, and systematizing relevant documents. Based on these materials, the authors conduct a content analysis, synthesizes key arguments, and categorizes core theoretical and practical issues, thereby providing a foundation for developing the theoretical and analytical frameworks and the structure of the research findings.

(2) *Policy analysis:* this method is used to clarify the policy context, strategic orientations, and institutional framework of digital transformation in education and training in Vietnam, as well as their relationship with the requirements for developing teachers' digital competence.

(3) *Comparative - contrastive method:* this method is applied at three levels: (1) Comparing international teacher digital competence frameworks with current approaches, regulations, and proposed digital competence frameworks in Vietnam, based on criteria such as competence structure, level of emphasis on digital pedagogy, data literacy, AI integration, digital safety and ethics; (2) Comparing policy requirements regarding teachers' digital competence with the actual situation reflected in reports, surveys, and research studies; and, (3) Comparing solution groups proposed in previous studies with the system of solutions presented in this article, thereby ensuring the principle of selective inheritance.

(4) *Secondary data analysis:* the study primarily uses secondary data from published surveys and reports on digital competence, information technology competence, and online teaching among teachers, university lecturers, and pedagogical students. These data are used to illustrate and support arguments concerning the current situation, rather than to provide a comprehensive statistical description or quantitative inference.

4. Current situation of digital competence development of Vietnamese teaching workforce

4.1. Achievements

In recent years, the digital competence and capacity for digital transformation of the Vietnamese teaching workforce have shown significant progress. Results from the 2024 Teaching and Learning International Survey (TALIS) conducted by the OECD across 55 countries and territories indicate that Vietnam has been recognized as one of the "bright spots" in terms of teachers' technological competence and digital transformation capacity. Specifically, Vietnamese teachers' technological and digital transformation competence has been rated relatively high in international comparison, with as many as 64% of Vietnamese teachers reporting that they have used AI in teaching. This figure ranks fifth among the 55 participating countries and territories and is significantly higher than the OECD average of 36%. This finding demonstrates that a substantial proportion of teachers have not only accessed new digital technologies but have also proactively integrated them into their teaching activities. Furthermore, the report notes that the Vietnamese teaching workforce has a relatively young average age (42 years), an increasingly strong technological competence, and high job satisfaction, providing a favorable foundation

for continued development of digital competence in the coming stages (Xuan, 2025).

In addition, teachers' attitudes, motivation, and professional culture create a favorable environment for the development of digital competence. Up to 97% of Vietnamese teachers report satisfaction with their profession, 92% believe that the teaching profession is valued by society (the highest among participating countries), 87% believe their opinions are heard by policymakers, and 95% acknowledge the positive impact of professional development activities (An, 2025). These figures indicate that Vietnam has a committed teaching workforce characterized by strong professional engagement, a collaborative spirit, and a readiness to participate in professional development programs and update their knowledge, including digital competence training. This represents an important socio-psychological condition that enables digital competence development programs for teachers to achieve substantive effectiveness, avoiding administrative imposition.

Furthermore, training and professional development programs on digital transformation and digital competence for teachers have been widely implemented, with content increasingly focusing on practical depth. The online training series titled "Enhancing digital transformation competence in education," organized by the OLM digital education platform from August 15 to August 28, 2025, attracted more than 20,000 teachers nationwide. The program included seven thematic modules focusing on digital transformation in teaching and educational management, aligned with emerging trends such as STEM and AI (Chi, 2025). The program not only introduced digital tools but also emphasized hands-on training, guiding teachers in creating digital learning resources, using learning management systems, assigning tasks, and analyzing students' learning outcomes. This demonstrates that fostering activities are shifting from theoretical instruction to training teachers in practical digital skills and competencies. Many localities, particularly major urban centers, have also proactively set goals to equip 100% of teachers with digital competence and have organized system-wide professional development programs. In Ho Chi Minh City, the Department of Education and Training has set a target that 100% of students and teachers in the city will be equipped with digital competence in the 2025 - 2026 academic year. At the same time, training conferences have been organized for managers and teachers of junior and high schools on developing digital competence for general education students. The training content emphasizes the role of schools, and especially individual teachers, in developing learners' digital competence. Additionally, professional teams are required to develop plans to support and enhance teachers' digital competence, aligned with subject-specific requirements and the conditions of each school (Hoa, 2025).

Moreover, pioneering digital transformation models implemented in certain schools and educational institutions have begun to foster a digitally competent teaching workforce. The Hanoi College of High Technology has established a two-phase digital transformation roadmap. The initial phase focuses on digitizing core governance and training processes, while the subsequent phase expands system integration and strengthens digital competence training for administrators, teachers, students, and even local officials. The College regularly invites domestic and international experts to provide digital skills training for its staff. In several key schools, initiatives of "students innovating with AI" have been implemented, requiring teachers to continuously update their technological knowledge and adopt AI-integrated teaching methods, thereby extending the learning environment beyond traditional classroom boundaries (Trang, 2025). These models have been contributing to the formation of a core

group of "digital pioneer" teachers who play a crucial role in promoting and leading the development of digital competence across the education sector.

4.2. Limitations and challenges

Despite these positive developments, the digital competence of the Vietnamese teaching workforce remains marked by numerous systemic limitations and challenges. First, digital infrastructure and the digital environment supporting teaching and learning remain inconsistent and do not fully meet the requirements of digital transformation. Results from the 2024 TALIS survey published by the OECD indicate that although 64% of the teachers in Vietnam reported using AI in teaching, up to 71% stated that their schools lacked the necessary infrastructure and digital tools to effectively implement AI, and 60% reported insufficient knowledge and skills to utilize this technology effectively (Xuan, 2025).

Several analyses of digital transformation in education have also highlighted significant disparities across regions. Many educational institutions in remote and disadvantaged areas still face difficulties in accessing high-speed Internet, digital teaching and learning equipment, and smart classroom environments. In contrast, schools in urban areas often have more favorable conditions for implementing modern classroom models and using multiple digital platforms for management and instruction (Quyen, 2025). This inconsistency results in unequal opportunities for teachers and students across different localities, educational levels, and types of schools to develop digital competence. In many areas, teachers may be motivated to innovate but remain constrained by inadequacy of infrastructure, equipment and network connectivity. In addition, many teachers remain at a basic level of information technology use and have not yet developed sufficient digital pedagogical competence to design, organize, and assess learning activities in digital environments. Most teachers have not received in-depth training in technological skills, making the integration of technology into teaching challenging. Many still adhere to traditional teaching approaches characterized by limited interaction and a lack of creativity. This situation contributes to what may be described as "superficial digitization," in which lesson plans and instructional materials are uploaded to digital platforms, while teaching methods, activity organization, and assessment practices remain largely traditional, failing to fully leverage the advantages of digital technologies and learning data.

Furthermore, awareness and competence among some teachers in ensuring cybersecurity, digital safety, ethics, and digital culture remain limited, while risks in cyberspace continue to increase. Cyberattacks targeting the education sector have risen significantly worldwide amid the rapid expansion of online learning. Many teachers and students in Vietnam however have not received adequate training in information security knowledge and skills when participating in online learning environments, exposing them to risks such as system intrusion, data theft, classroom disruption, or the dissemination of harmful content (Ministry of Science and Technology, 2021). More recently, the increasing use of online learning platforms and cloud-based services in educational institutions has raised new concerns regarding data privacy and security for both students and teachers. In fact, there have been reports of data breaches involving approximately 30 million users associated with an educational website, according to the media. This highlights the high sensitivity and vulnerability of teachers' and students' personal information in digital environments (Quy, 2022). Under these circumstances, many teachers have not yet been adequately equipped with the skills needed to identify risks, configure secure systems, or guide students to use online learning platforms safely and responsibly.

Additionally, workload pressures, psychological factors, and insufficient support conditions for developing teachers' digital competence have contributed to reluctance and even fatigue among some teachers. Many teachers have shared that "one online teaching session is equivalent to five face-to-face ones," due to the substantial time required to design digital lessons, address technical issues, manage remote classrooms, and assess and provide feedback on student work electronically, while still fulfilling numerous administrative and professional responsibilities (Vi, 2021). These pressures are particularly pronounced among older teachers, those working in disadvantaged areas, and teachers in non-public institutions, who often face limited opportunities for technological professional development, combined with income pressures, performance emulation criteria, and expectations from students' parents.

4.3. Causes of limitations and challenges

The aforementioned limitations and challenges in developing digital competence among the Vietnamese teaching workforce result from the combined effects of multiple interrelated factors, including institutional and policy frameworks, resource availability, training and professional development models, and individual factors and school digital culture. These causes can be broadly summarized into several key categories as follows:

First, regarding institutional and policy-related factors. Although the Party, the State, and the education sector have issued numerous important directives and policy documents regarding digital transformation and the development of digital competence, the policy system specifically targeting teachers' digital competence remains incomplete and under development. While a digital competence framework for learners has been established, a dedicated digital competence framework for teachers - aligned with professional standards, recruitment mechanisms, evaluation, appointment, and classification systems - has not yet been fully and consistently promulgated. As a result, although objectives and requirements concerning teachers' digital competence have been articulated in guiding documents, they have not yet become "hard standards" in human resource planning, utilization, and professional development. In many contexts, the development of teachers' digital competence is still viewed as a supplementary or supportive activity rather than a core requirement in teacher evaluation and institutional accreditation processes.

Second, regarding resources and necessary conditions. Digital infrastructure - including devices, network connectivity, platforms, and technical support systems - in many localities, particularly in remote, mountainous, and socio-economically disadvantaged areas, does not yet meet the minimum requirements for teachers to regularly conduct teaching in digital environments and continuously practice and apply digital competence. Funding mechanisms for digital competence training and professional development remain heavily dependent on the financial capacity of individual localities and educational institutions, resulting in significant disparities in access to professional development opportunities among teachers across different regions. Furthermore, the number of specialized IT personnel and technical support staff in schools remains limited, with many serving in concurrent roles rather than dedicated positions. As a result, technical support capacity is insufficient to effectively assist teachers in digitizing teaching and learning activities and educational management.

Third, regarding training, fostering, and support programs for digital professional development. Teacher training and fostering programs at pedagogical institutions are undergoing a transformation to incorporate more content related to information

technology and digital transformation. However, in many cases, these programs remain focused on equipping teachers with isolated technical skills, lack a systematic structure, and are not closely aligned with professional digital competence frameworks. A clear developmental pathway for digital competence - from basic to advanced levels - has not yet been established, corresponding to different career stages and professional positions (such as classroom teachers, subject leaders, and managers). Professional development activities are still largely characterized by short-term training sessions and large-scale workshops, which provide insufficient time for teachers to engage in practical application, receive personalized guidance, or obtain in-depth feedback on their digital teaching products. Furthermore, mechanisms for recognizing professional development outcomes (such as credits, certifications, performance evaluation scores, and promotion opportunities) remain insufficiently attractive to create strong incentives for teachers to invest the necessary intellectual effort and time in developing their digital competence.

Fourth, regarding individual factors and digital culture within schools. At the individual level, alongside a group of young, dynamic, and highly motivated teachers, many teachers experience "technology anxiety," particularly older teachers and those with limited exposure to digital environments. Administrative workload, documentation requirements, performance pressures, and income-related concerns also limit teachers' ability to allocate sufficient time for self-directed learning and digital competence development, resulting in a reactive rather than proactive mindset toward digital transformation. In many educational institutions, a clear digital culture has not yet been fully established. The use of technology often remains driven by administrative directives or dependent on a small number of core teachers, lacking systematic mechanisms for knowledge sharing, collaborative learning, and the development of sustainable digital professional communities.

5. Solutions for developing digital competence among Vietnamese teachers in the context of comprehensive digital transformation of education and training

In order to build upon the achievements and address the limitations and challenges analyzed above, and to ensure that teachers' digital competence becomes a breakthrough factor in achieving the goals of comprehensive digital transformation in education and training, it is necessary to implement a comprehensive and coordinated system of solutions as follows:

5.1. Improving institutional frameworks and standardizing the digital competence framework for teachers

First, it is necessary to promptly develop and promulgate a national digital competence framework for teachers, ensuring compatibility with the digital competence framework for learners as stipulated in Circular No. 02/2025/TT-BGDDT dated January 24, 2025, while also referencing international frameworks such as DigCompEdu and ICT-CFT. This framework should clearly define competence domains, component competencies, and levels of proficiency, encompassing three core pillars: (1) Competence in using digital tools and environments; (2) Digital pedagogical competence in designing, organizing, assessing, and supporting learning; and, (3) Digital ethics, culture, and safety, with provisions for emerging requirements related to big data and AI.

Second, digital competence should be integrated into human resource management mechanisms, including professional standards for teachers and lecturers, as well as recruitment, utilization, evaluation, appointment, and professional ranking criteria. This requires reviewing and revising

existing regulatory documents to establish digital competence as a mandatory criterion rather than merely an additional advantage, thereby transforming digital competence requirements from general recommendations into concrete professional commitments for every teacher. At the same time, a standardized digital competence assessment toolkit for teachers should be developed and applied across the entire education sector, combining self-assessment, peer assessment, managerial evaluation, and evidence such as digital teaching products and student learning outcomes. Assessment results should be meaningfully used in workforce planning, training, professional development, utilization, and incentive mechanisms, thereby establishing a clear link between digital competence standards and teachers' career development pathways. Furthermore, institutional reform must be accompanied by a clear implementation roadmap and defined responsibilities assigned to the Ministry of Education and Training, relevant ministries and agencies, and local authorities, along with appropriate resource allocation. Only when supported by a robust legal framework and effective implementation mechanisms can the digital competence of the teaching workforce be developed sustainably, rather than depending on short-term initiatives as is currently the case in some areas.

5.2. Innovating training, fostering, and digital professional development for teachers

To achieve this goal, pedagogical institutions need to restructure their curricula by integrating digital competence as a core component of expected learning outcomes. Pedagogical students must be trained and given opportunities to practice using digital teaching platforms, assigned tasks requiring them to design, organize, and assess learning activities in digital environments, and given chances to undertake teaching practicums in schools that have implemented digital transformation, thereby gaining exposure to real-world "digital schools" and "smart classrooms." This approach will help establish a solid foundation of digital competence from the outset of their careers, preventing the situation in which teachers become professionally outdated upon entering the workforce.

For in-service teachers, it is essential to shift from short-term, fragmented training programs toward continuous digital professional development aligned with the Digital Competence Framework for Teachers. Each teacher should maintain an individual digital competence development portfolio, regularly updated through participation in professional development courses, the creation of digital teaching products, and engagement in professional learning communities. Training content should focus on core digital pedagogical competencies, including blended learning implementation, learning experience design, competence-based assessment in digital environments, the use of data and AI tools for personalized learning, and ensuring digital safety and ethics for learners.

Regarding implementation methods, a flexible combination of face-to-face and online training modalities should be adopted. Project-based and product-oriented learning models should be applied, whereby teachers develop practical outputs such as digital lesson plans, learning materials, and teaching plans that can be directly applied in their professional practice. At the same time, digital professional learning communities should be strengthened to enable teachers to share experiences and support one another. Additionally, appropriate mechanisms should be established to formally recognize and convert professional development outcomes into performance evaluation scores, promotion eligibility, and professional ranking criteria, thereby creating genuine motivation for teachers to invest in developing their digital competence, rather than participating in training solely to obtain certificates.

5.3. Developing digital infrastructure and ecosystems to support teachers in applying digital competence

First, it is necessary to comprehensively implement the objectives of the Project "Strengthening the application of information technology and digital transformation in education and training for the period 2022 - 2025, with orientation to 2030," approved by the Prime Minister under Decision No. 131/QD-TTg dated January 25, 2022. The primary focus should be on expanding digital infrastructure coverage across all educational institutions, with particular priority given to remote, disadvantaged, and underserved areas. Beyond simply providing Internet access, infrastructure must ensure sufficient stability in terms of speed and bandwidth to enable teachers to conduct online teaching, utilize digital learning resource repositories, access data analytics tools, and implement real-time interactive learning activities.

Second, it is essential to develop and improve shared digital platforms across the education sector, including learning management systems (LMS), national digital learning resource repositories, online testing and assessment platforms, and learning data management systems. These platforms should be made user-friendly, with consistent interfaces, clear usage guidelines, and integrated tools to support teachers in designing lessons, creating assessments, assigning tasks, and monitoring student learning progress and outcomes. This would enable teachers to avoid "fending for themselves" in making choices, experimenting with too many disorganized tools, and instead focus on investing in professional development. At the same time, each educational institution should establish dedicated digital transformation units or personnel with fundamental technological and digital pedagogical competence to provide technical support, offer consultation, and serve as liaisons with technology providers and service platforms. Such support mechanisms would help reduce the technological learning burden on teachers, particularly older teachers and those working in remote and disadvantaged areas.

Third, public-private partnerships should be encouraged to foster the development of the digital education ecosystem, based on clearly defined technical standards, regulations, and data protection policies. The State should establish the regulatory framework and strategic priorities (aligned with digital transformation in education and the development of digital competence among teachers and learners), while technology enterprises contribute technological solutions, platforms, and services. Educational institutions and teachers should actively participate by providing feedback and engaging in co-creation processes. The richer and more diverse the digital ecosystem becomes, the greater the opportunities for teachers to develop and apply their digital competence flexibly and creatively.

5.4. Strengthening multi-stakeholder cooperation to support the equitable development of teachers' digital competence

Accordingly, targeted support programs should be designed for teachers working in disadvantaged, remote, mountainous, and ethnic minority areas, where infrastructure conditions and access to professional development opportunities remain limited. Support measures may include providing digital devices and Internet connectivity under preferential policies; organizing flexible training programs using "mobile training" models that combine face-to-face and online formats; and, establishing digital mentoring networks or digital support teams at the commune or school cluster level to provide ongoing assistance to teachers. In addition, it is necessary to develop and empower core groups of teachers specializing in digital transformation at the local and subject levels. These teachers, who possess strong digital competence and a commitment to professional sharing, can serve as key

facilitators in organizing digital professional learning activities, delivering internal training, and supporting colleagues in addressing practical challenges in digital teaching. Appropriate recognition and incentive mechanisms should be established to encourage these teachers to fully assume their leadership roles.

Furthermore, multi-stakeholder cooperation in developing teachers' digital competence should be strengthened, involving collaboration among the education sector, technology enterprises, universities, research institutes, and international organizations such as UNESCO, UNICEF, the European Union (EU), and the World Bank (WB). Based on the strategic orientations outlined in the Politburo's Resolution No. 71-NQ/TW dated August 22, 2025 and the Government's Action program under Resolution No. 281/NQ-CP dated September 15, 2025, such cooperation should focus on developing professional development programs, expanding open educational resources, implementing pilot digital teaching models, and sharing international experiences in teachers' digital competence development.

Finally, it is important to encourage networking among domestic and international educational institutions to establish transnational professional communities of practice, where Vietnamese teachers can learn from and share experiences related to digital teaching, AI integration, and development of open learning environments. This effort not only promotes equity and inclusiveness in the development of teachers' digital competence but also broadens perspectives and enhances Vietnam's education and training system's capacity for international integration in the digital era.

6. Conclusion

Overall, the digital competence of the Vietnamese teaching workforce is currently emerging as an important component of professional competence. However, a significant gap remains between policy expectations and the actual competence of a considerable proportion of teachers. From a policy perspective, the Politburo's Resolution No. 71-NQ/TW dated August 22, 2025, the Government's Resolution No. 281/NQ-CP dated September 15, 2025, along with various sector-specific projects and circulars, have established a relatively comprehensive framework for digital transformation in education and training, emphasizing the central role of teachers. Nevertheless, the institutionalization of these policies into concrete teacher digital competence frameworks, assessment tools, human resource mechanisms, and support resources has experienced delays, thereby reducing the effectiveness of policy implementation at the grassroots level. From a practical perspective, the research findings present a dual reality. On the one hand, there have been positive developments in teachers' attitudes, motivation, and technological readiness, as well as the emergence of pioneering models in certain localities and educational institutions. On the other hand, significant disparities persist in digital infrastructure, access to professional development opportunities, digital pedagogical competence, and digital safety and ethics skills, particularly in disadvantaged areas. This reality indicates that focusing solely on training teachers in technological tools, without simultaneously addressing institutional, infrastructural, and school governance bottlenecks, will not be sufficient to achieve a substantial and sustainable transformation in teachers' digital competence. Therefore, the comprehensive solutions proposed in this study are intended not only to address immediate challenges but also to promote a systemic approach encompassing institutional improvement, standardization of digital competence frameworks, innovation in training and professional development, development of digital infrastructure and ecosystems, targeted support measures, and strengthened multi-

stakeholder cooperation. These solutions will hopefully provide valuable policy recommendations to ensure that teachers' digital competence becomes a genuine internal driving force for the comprehensive digital transformation of education and training in Vietnam in the coming period.

References:

1. An, H. (2025). *Vietnamese teachers' digital transformation competence as a bright spot.* Retrieved from https://www.vietnamplus.vn/nang-luc-chuyen-doi-so-cua-giao-vien-viet-nam-la-diem-sang-post1075434.vnp

2. Central Executive Committee. (2025). *Resolution No. 71-NQ/TW dated August 22, 2025, of the Politburo on breakthrough development of education and training.*

3. Chi, M. (2025). *Over 20,000 teachers nationwide participate in training to enhance digital transformation competence in education*. Retrieved from https://giaoducthoidai.vn/hon-20000-giao-vien-ca-nuoc-tap-huan-nang-cao-nang-luc-chuyen-doi-so-giao-duc-post747815.html

4. Chinen, M. (2025). *Teaching in the digital era: What digital pedagogical competencies matter most? Insights from global frameworks.* World Bank. Retrieved from https://openknowledge.worldbank.org/server/api/core/bitstreams/c3d24ebb-ec55-4570-9c2a-a40348249219/content

5. Hoa, Y. (2025). *100% of students and teachers in Ho Chi Minh City to be equipped with digital competence.* Retrieved from https://giaoduc.edu.vn/100-hoc-sinh-giao-vien-tp-hcm-duoc-trang-bi-nang-luc-so/

6. Hung, D. V., & Hoa, T. D. (2022). *Digital competence for online teaching and learning.* Retrieved from https://scholar.dlu.edu.vn/thuvienso/bitstream/DLU123456789/183198/1/CVt43S022022003.pdf

7. Khue, L. T. T. (2024). *Digital competence in university teaching.* Retrieved from https://tamlygiaoduc.com.vn/wp-content/uploads/2024/12/5.Ky-1-T11-Edited-4.-thanh-khue-1-so-thuong-t11.pdf

8. Ministry of Science and Technology. (2021). *Information security risks in online teaching: Implications and urgent solutions.* Retrieved from https://mst.gov.vn/mat-an-toan-thong-tin-trong-day-hoc-truc-tuyen-nhung-he-luy-va-giai-phap-cap-bach-197150080.htm

9. Nam, P. T., & Y, N. T. N. (2025). *A literature review on digital competence development for early childhood education students in Vietnam*. Dong Thap University Journal of Science, 14(01S), 312–326. Retrieved from https://www.researchgate.net/publication/394128141_Nghien_cuu_tong_quan_ve_phat_trien_nang_luc_so_cho_sinh_vien_nganh_giao_duc_mam_non_o_V

10. National Assembly of Vietnam. (2019). *Law on Education (2019).*

11. Quyen, H. T. (2025). *Digital transformation in Vietnamese education: Limitations, challenges, and opportunities.* Retrieved from https://sokhcn.cantho.gov.vn/default.aspx?nid=29064&pid=57

12. Quy, L. (2022). *Ministry of Education and Training responds to alleged data breach involving 30 million users.* Retrieved from https://vnexpress.net/bo-gd-amp-dt-len-tieng-ve-nghi-van-lo-du-lieu-30-trieu-nguoi-dung-4487370

13. Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu.* Publications Office of the European Union. Retrieved from https://publications.jrc.ec.europa.eu/repository/handle/JRC107466

14. Thanh, N. D., Quang, D. M., & Toan, H. S. (2025). *Analysis of digital competence frameworks for teachers in selected countries and implications for Vietnam.* Journal of Educational Management Science, 2/2022, 3–11. Retrieved from https://tapchikhqlgd.edu.vn/wp-content/uploads/2025/07/1-Nguyen-Dac-Thanh-Duong-Minh-Quang-Ho-Sy-Toan.pdf

15. Trang, T. (2025). *Digital transformation in education: Ensuring no one is left behind.* Retrieved from https://baochinhphu.vn/chuyen-doi-so-trong-giao-duc-khong-de-ai-bi-bo-lai-phia-sau-102250807140451116.htm

16. UNESCO. (2018). *ICT competency framework for teachers: Version 3.* UNESCO. Retrieved from https://teachertaskforce.org/sites/default/files/2020-07/ict_framework.pdf

17. Vi, D. (2021). *Online teaching pressure during the pandemic: "One online lesson equals five face-to-face lessons."* Retrieved from https://suckhoedoisong.vn/ap-luc-day-online-mua-dich-1-tiet-day-truc-tuyen-bang-5-tiet-truc-tiep-169210923232937574.htm

18. Xuan, T. (2025). *Vietnamese teachers actively engage in digital transformation and demonstrate improving technological competence.* Retrieved from https://nhandan.vn/giao-vien-viet-nam-tich-cuc-chuyen-doi-so-co-nang-luc-cong-nghe-ngay-cang-tot-post921143.html