



MEASURES FOR MANAGING THE DEVELOPMENT OF DIGITAL COMPETENCIES IN TEACHING FOR HIGH SCHOOL TEACHERS IN HANOI, VIETNAM

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Abstract:

In the context of the digital transformation of education, developing the digital teaching competencies of high school teachers is an urgent necessity for enhancing teaching quality and meeting the demands of educational reform. This paper examines the theoretical foundations of managing the development of these competencies and proposes five management measures for high schools in Hanoi, Vietnam. These measures are designed to be comprehensive and aligned with the practical needs of high schools and the requirements of educational digital transformation, thereby contributing to improved management efficiency, the development of teachers' digital competencies, and the overall quality of instruction.

Keywords: digital competence, management, digital competence development, high school teachers, digital transformation

1. Introduction

Digital transformation is profoundly reshaping educational activities, particularly the methods of organizing instruction in high schools. Advancements in artificial intelligence (AI), big data, cloud computing, learning management systems (LMS), and digital learning resources have paved the way for innovations in lesson design, instructional organization, assessment, and personalized learning support. In this context, digital

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competence in teaching has emerged as a core professional competency for educators, determining the effectiveness of digital technology application in enhancing the quality of instruction. Recognizing this trend, the European Union issued the Digital Competence Framework for Educators (DigCompEdu), which outlines six areas and 22 specific competencies to serve as a foundation for developing and assessing teachers' digital competence (Redecker, 2017).

In Vietnam, the digital transformation of education is identified as a key task in achieving the fundamental and comprehensive reform of education and training. The implementation of the 2018 General Education Curriculum, coupled with the requirement to apply digital technology in instruction, demands that teachers not only possess the ability to use technology but also know how to effectively integrate it into the processes of designing, organizing, assessing, and improving teaching activities. This creates an urgent need to develop teachers' digital teaching competencies, a process in which school administrators play a pivotal role in providing direction, organization, and support, as well as fostering motivation.

Current international research on teachers' digital competence primarily focuses on establishing competence frameworks, identifying structural components, and developing assessment tools based on reference models such as DigCompEdu (Ghomi & Redecker, 2019; Falloon, 2020). Literature reviews indicate that most studies concentrate on identifying dimensions of digital competence, assessing proficiency levels, and examining factors influencing the development of teachers' digital competence (Smestad *et al.*, 2023). However, the management perspective regarding the development of digital competence among high school teachers—specifically concerning planning, organizing professional development, creating supportive environments, and evaluating development outcomes—remains insufficiently explored. Given the context of digital transformation in Vietnam's education sector, this issue warrants further study to propose management solutions tailored to the specific characteristics of high schools.

Based on the aforementioned issues, this article focuses on clarifying the theoretical foundations for managing the development of digital competencies among high school teachers in their instructional practice. It proposes a system of management measures tailored to the context of high schools in Hanoi, thereby contributing to enhancing the quality of the teaching workforce and meeting the requirements of digital transformation in education.

2. Theoretical basis for managing the development of teachers' digital competence in teaching at high schools

2.1 Some fundamental concepts

2.1.1 Digital competence in teaching

First, UNESCO (2018) defines digital competence as the ability to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately through digital technologies to meet the demands of the labor market,

professional work, and entrepreneurship. From this perspective, digital competence encompasses the ability to use technology, computers, and information and communication technologies (ICT), and is recognized as an essential competence in the context of the Fourth Industrial Revolution (UNESCO, 2018).

In the field of education, the concept of digital competence has evolved to be closely linked to teachers' professional activities. According to the European Framework for the Digital Competence of Educators (DigCompEdu), a teacher's digital competence encompasses the knowledge, skills, and attitudes required to effectively use and integrate digital technology into professional practices—particularly in teaching and supporting learners (Redecker, 2017). This framework comprises six areas: professional engagement in digital environments; sourcing and creating digital resources; teaching and learning; assessment; empowering learners; and facilitating the development of learners' digital competence. Similarly, UNESCO (2018) emphasizes that a teacher's digital competence extends beyond the mere ability to use technology; it entails the capacity to integrate technology into pedagogical practice to enhance teaching quality, innovate teaching methods, and foster learner competence within digital environments.

Based on the perspectives above, it is evident that teachers' digital competence is a broad concept reflecting the ability to use, apply, and leverage digital technology across all professional activities—such as teaching, scientific research, learning management, professional collaboration, and professional development. Within this framework, digital competence in teaching serves as a core component, demonstrating a teacher's ability to effectively use and integrate digital technology into the design, organization, and assessment of instruction to enhance the quality and effectiveness of student learning (Redecker, 2017).

In the context of digital transformation in Vietnam, Nguyen, T. G. (2022) posits that digital competence is both a general competency and a crucial professional competency for teachers. According to the author, digital competence in teaching is demonstrated through the ability to execute key instructional tasks—such as building digital databases, designing digital lessons, and organizing instruction on Learning Management Systems (LMS) using digitized teaching methods—while also assessing learning outcomes via appropriate software.

Building upon the aforementioned perspectives, a teacher's digital competence in instruction is understood as the ability to mobilize a combination of knowledge, skills, and attitudes to effectively select, use, integrate, and leverage digital technologies when designing, organizing, and evaluating teaching activities, thereby enhancing educational quality and meeting the demands of digital transformation in education.

2.1.2 Developing digital competence in teaching

In the context of the digital transformation of education, the ability to use and integrate digital technology into teaching has become a crucial requirement for teachers. Consequently, developing teachers' digital competence in teaching aims not only to

enhance their technological proficiency but also to foster the ability to effectively utilize digital technology in the design, organization, and assessment of teaching activities.

According to Krumsvik (2011), a teacher's professional digital competence is the ability to use digital technology effectively and responsibly in education; this encompasses integrating technology into instruction, designing digital learning activities, guiding learners in the appropriate use of technology, and making technology-related pedagogical decisions. Accordingly, the development of teachers' digital competence is viewed as the process of enhancing these capabilities through training, professional development, and professional experience.

Furthermore, Domínguez-González *et al.* (2025) emphasize that developing teachers' digital competence is a continuous process of training and professional development aimed at helping them adapt to the evolution of digital technology and integrate it into their teaching practices. This process encompasses not only the acquisition of technical skills but also the development of a digital pedagogical mindset, the ability to design innovative learning activities, and the capacity to leverage technology to enhance student learning outcomes.

Based on the perspectives above, it is evident that developing teachers' digital competence in instruction is a continuous professional development process. Through training, professional development, and practical application, teachers acquire and refine the knowledge, skills, and attitudes necessary to effectively utilize, integrate, and leverage digital technology in the design, organization, and assessment of teaching activities, thereby contributing to the enhancement of educational quality in the context of digital transformation.

2.1.3 Management of digital competency development in teaching for high school teachers

Management is a concept approached from various perspectives. According to M.P. Follett, "*management is the art of getting things done through people*" (as cited in Vo, 2008). Meanwhile, H. Fayol approached management through basic functions: planning, organizing, commanding, coordinating, and controlling (as cited in Nguyen, 2003). In Vietnam, Bui *et al.* (2011) asserted: "*management is the organized, goal-oriented influence exerted by the managing entity upon the object of management to achieve established objectives.*"

Based on the above perspectives, management can be understood as the process of organized, purposeful influence exerted by the managing entity upon the object of management—through the functions of planning, organizing, directing, and controlling—to achieve defined objectives.

Based on the concept of managing and developing teachers' digital competencies in instruction, the management of digital competency development for high school teachers is understood as the purposeful and organized process by which school administrators and educational management agencies influence teachers' digital competency development through management functions such as planning, organizing, directing, and monitoring. This process aims to enhance teachers' knowledge, skills,

attitudes, and ability to apply digital technologies in designing, organizing, and evaluating instructional activities, thereby contributing to improved educational quality in the context of digital transformation.

2.2 Structure of digital competence in teaching for high school teachers

Globally, numerous organizations have developed digital competence frameworks for teachers to define the essential requirements for educators in the context of digital transformation. The "Professional Digital Competence Framework for Teachers" from the Norwegian Centre for ICT in Education emphasizes the integration of technological and pedagogical competencies, comprising six competence areas: (1) understanding ICT in education; (2) curriculum and assessment; (3) pedagogy; (4) application of digital competence; (5) organization and management; and (6) professional development. Each competence area is developed across three levels: mastery, deepening, and innovation (Benali & Mak, 2022).

The Digital Competence Framework for Educators (DigCompEdu), developed by the European Union's Joint Research Centre, is regarded as a widely recognized reference framework for teachers' digital competence. It comprises six competence areas with 22 specific competences and six proficiency levels ranging from A1 to C2, covering: (1) professional engagement in digital environments; (2) digital resources; (3) digital teaching and learning; (4) assessment in digital environments; (5) empowering learners through digital technology; and (6) facilitating learners' digital competence (Redecker, 2017).

Meanwhile, the UK's Digital Teaching Professional Framework (DTPF) approaches teachers' digital competence by integrating technology and pedagogy, identifying three stages of competence development: developing, proficient, and advanced. This framework encompasses 12 competence areas, focusing on the use of hardware and software, digital data utilization, communication and collaboration in digital environments, digital content creation, and the design, implementation, and evaluation of digital learning activities (Subrahmanyam, 2022).

In Vietnam, approaching the subject from the perspective of teaching activities, Tran (2022) posits that teachers' digital competence in instruction comprises four components: the ability to design digital lessons/lesson plans; the ability to develop databases and digital learning materials; the ability to implement digital teaching processes; and the ability to use digital tools and equipment. Building upon this perspective, Nguyen (2022) further specifies these components of teachers' digital instructional competence as: the ability to design digital lessons; the ability to use digital tools and equipment; the ability to implement digital teaching processes; and the ability to develop databases and digital learning materials. These competencies are demonstrated through the ability to use specialized software, design digital content, set up classrooms on LMS/LCMS platforms, organize online or blended instruction, utilize digital learning resources, and apply technology in assessment and evaluation.

Drawing upon international digital competence frameworks and domestic research, this study structures the digital instructional competence of high school teachers into six fundamental components:

- 1) Digital technology usage competence: the ability to use digital devices, software, and platforms for teaching and learning activities effectively, safely, and appropriately.
- 2) Digital instructional design competence: the ability to create technology-integrated lesson plans, design digital lectures, and develop and utilize digital learning materials to meet instructional objectives.
- 3) Competence in organizing instruction in a digital environment: the ability to organize, facilitate, and manage learning activities within a digital environment—including online and blended learning—and to utilize learning management systems (LMS/LCMS).
- 4) Competence in digital-based assessment and evaluation: the ability to design and use online assessment tools, leverage learning data, and ensure information security and privacy during the assessment process.
- 5) Digital communication and collaboration competence: the ability to use technology to exchange information and collaborate professionally with students, parents, and colleagues, as well as to participate in online learning communities, while adhering to ethical and legal standards in the digital environment.
- 6) Competence in self-directed learning and professional development in a digital environment: the ability to leverage digital technology for learning, updating knowledge, sharing experiences, and pursuing continuous professional development.

These components are interconnected, mutually reinforcing, and supportive of one another. Specifically, digital technology usage competence serves as the foundation; digital instructional design and organization competence plays a central role; digital assessment and digital communication/collaboration competencies act as supporting elements; and the competence for self-directed learning and professional development ensures the sustainable growth of teachers' digital competence in instruction.

2.3 Content of managing the development of teachers' digital competencies in instruction at high schools

The management of developing teachers' digital competencies in instruction at high schools is carried out through fundamental management functions: planning, organizing, directing, and monitoring/evaluating. Key management activities include:

2.3.1 Planning for the development of teachers' digital competencies in instruction

Planning is the initial step that guides the entire process of developing teachers' digital competencies in instruction. This activity involves surveying and assessing the current state of teachers' digital competencies based on established criteria; analyzing needs; and defining goals and a development roadmap aligned with the education sector's digital

transformation direction and the school's practical conditions. Based on this foundation, a digital competency development plan is formulated—detailing content, formats, timelines, resources, and implementation conditions—to ensure feasibility and effectiveness.

2.3.2 Organizing the development of teachers' digital competencies in teaching

Organizing digital competency development focuses on establishing coordination mechanisms, assigning responsibilities, and mobilizing resources to implement the established plan. This involves organizing professional development and support activities through various formats—such as training sessions, professional learning communities, lesson studies, and online learning—and building a digital learning environment comprising technology platforms, learning management systems, digital resource repositories, and professional communities to enable teachers to practice, share, and enhance their digital competencies.

2.3.3 Directing the development of teachers' digital competencies in teaching

Directing digital competency development is the process of providing guidance, managing operations, and fostering activities aimed at building digital competencies within the school. This entails raising awareness among administrators and teachers regarding the role of digital competency in educational innovation; guiding and supporting teachers in integrating digital technology into the design, organization, and assessment of teaching activities; and establishing incentive mechanisms and fostering motivation while cultivating a culture of professional sharing and collaboration within the digital environment.

2.3.4 Monitoring and assessing the development of teachers' digital competence in teaching

Monitoring and assessment aim to track implementation progress, determine achieved results, and adjust the process of developing teachers' digital competence. This involves establishing criteria and tools for assessing digital competence and organizing periodic evaluations through various methods, such as self-assessment, evaluation by administrators, and assessment based on actual teaching practices and digital professional products. Assessment results serve as a basis for adjusting training plans and content, as well as for enhancing the management of digital competence development in teaching.

Recent studies on high school teachers in Vietnam indicate positive shifts in digital competence regarding teaching; however, the level of development remains uneven across different teacher groups and competence areas. A survey of secondary school teachers in Hanoi, Vietnam, based on the DigCompEdu framework, revealed that while the majority of teachers possess a good level of digital competence, the ability to apply digital technology in student assessment remains a limited area (Pham *et al.*, 2024). Furthermore, other studies have highlighted disparities in digital competence among

general education teachers, reflecting the influence of teaching conditions, professional experience, and access to training opportunities (Tran, 2025). These findings underscore that developing digital competence in teaching remains an urgent requirement for high school teachers in order to meet the demands of digital transformation in education.

3. Measures for managing the development of teachers' digital competencies in instruction at high schools

3.1 Developing a plan for the development of teachers' digital competencies in instruction that aligns with practical needs

Developing a plan for the development of teachers' digital competencies in instruction aims to ensure that capacity-building activities are implemented with clear objectives, a defined roadmap, and solutions that align with both the school's digital transformation requirements and the teachers' practical needs. The plan is formulated based on an accurate assessment of the current state of digital competencies and the identification of the gap between existing capabilities and required standards; this approach addresses issues such as scattered, unfocused training that fails to meet the specific development needs of different teacher groups.

The planning process must be grounded in the results of surveys and assessments of teachers' digital competencies in instruction—evaluated against the components of the established digital competency framework—while also analyzing the requirements of the high school curriculum, the school's digital transformation mandates, and the specific characteristics of each subject. Based on this foundation, the school defines objectives, targets, content, implementation roadmaps, organizational formats, resource allocation, responsibility assignments, and evaluation criteria; simultaneously, it tailors the plan to specific groups of teachers based on their competency levels and development needs.

To implement this measure, the school principal must direct the survey, collection, and analysis of data regarding teachers' digital competencies in instruction through methods such as self-assessment, evaluation by professional departments, classroom observations, and analysis of digital professional outputs. Based on the assessment results, the school leadership team collaborates with professional departments to formulate annual and phased digital competency development plans that are feasible and aligned with the school's specific conditions. During implementation, these plans are periodically reviewed and adjusted based on performance outcomes and emerging requirements for digital transformation in education.

3.2 Organizing digital competency training for teachers in a differentiated manner aligned with professional practice

Professional development is the primary pathway for teachers to build and enhance their digital competencies in teaching. These measures aim to improve teachers' knowledge, skills, and ability to utilize digital technologies, thereby meeting the demands of modernizing teaching methods and driving digital transformation in general education.

The school organizes digital competency training programs tailored to teachers' needs and proficiency levels, focusing on the following areas: using technology and digital platforms in teaching; designing digital learning materials; developing digital lessons; conducting online and blended instruction; applying technology to assessment and evaluation; leveraging learning data; and ensuring safety in the digital environment. Training methods should be diverse, combining in-person workshops, online learning, professional activities based on lesson study, experience sharing, and self-study via digital platforms.

To implement this measure, the school must base its training programs on the results of digital competency assessments, tailoring them to specific groups of teachers. Training for teachers with limited technological skills should focus on the use of basic digital tools and platforms, whereas for those with strong existing skills, the emphasis should be on developing capabilities in designing and creating digital learning materials and utilizing data in instruction. Furthermore, the principal should assign specialized departments, key teachers, and technology experts to support the training process; simultaneously, practical activities, product sharing sessions, and post-training application assessments should be organized to ensure that competencies are effectively integrated into actual teaching practice.

3.3 Establishing a digital learning environment and community to foster the development of teachers' digital competencies

Digital educational environments and professional communities play a vital role in sustaining, disseminating, and developing teachers' digital competencies. These measures aim to create conditions for teachers to regularly practice, share experiences, and support one another while integrating digital technology into their teaching.

The school establishes a digital learning environment by developing technological infrastructure, teaching support platforms, digital resource repositories, and online spaces for professional exchange. Simultaneously, it fosters digital learning communities within professional groups to promote sharing, collaboration, and innovation in teaching.

To implement this measure, the school principal must direct the review and enhancement of necessary conditions, such as technological equipment, network connectivity, teaching support software, and learning management systems. The school establishes mechanisms to encourage teachers to share digital lessons, digital learning materials, and experiences regarding the application of technology in professional activities. Professional groups are guided to conduct professional development activities in a digital environment, engage in technology-integrated lesson studies, and leverage the role of core teachers in supporting their colleagues.

3.4 Directing teachers to integrate digital technology into the design, organization, and assessment of teaching and learning activities

Directing teachers to integrate digital technology into the design, organization, and assessment of teaching and learning activities aims to transform digital competence—shifting from the mere ability to use technology to the capacity to apply it purposefully, in alignment with curriculum requirements and learner characteristics—thereby enhancing the quality and effectiveness of instruction.

The school guides teachers in selecting and utilizing digital technology that aligns with lesson objectives, subject content, and students' learning needs. Emphasis is placed on designing digital lessons, leveraging digital learning resources, and organizing learning activities in digital environments, while also applying technology to assessment in a manner that fosters the development of students' qualities and competencies.

To implement this measure, the school administration directs professional departments to establish criteria for evaluating the level of digital technology integration in lesson plans and the teaching process, and to guide teachers in selecting appropriate technologies to avoid superficial or tokenistic applications. Concurrently, the school regularly organizes classroom observations, professional development sessions, and evaluations of digital teaching products, while facilitating the sharing of effective technology application models and experiences to support teachers in applying their digital competencies to actual classroom practice.

3.5 Innovating assessment and evaluation to foster the development of teachers' digital teaching competencies

Innovating assessment and evaluation while fostering motivation is essential to ensuring the continuity and sustainability of the process of developing teachers' digital competencies in instruction. This approach enables schools to monitor the level of teachers' digital competency development, make timely adjustments to management and professional development activities, and encourage teachers to proactively innovate and enhance the effectiveness of digital technology application in teaching.

The school establishes a set of criteria for evaluating teachers' digital teaching competencies that aligns with professional standards and digital transformation requirements. This process incorporates various assessment methods—such as self-assessment, evaluations by administrators and professional groups, and reviews of lesson plans, digital products, teaching outcomes, and student feedback. Simultaneously, the school implements mechanisms to recognize and encourage teachers who actively apply digital technologies, develop digital learning resources, and share experiences within the professional community.

To implement this measure, the principal directs periodic evaluations and uses the results to adjust professional development plans, identify support needs, and apply appropriate incentive policies for teachers. The school regularly commends and rewards teachers who demonstrate effective initiatives, products, or models of digital technology application. Furthermore, it facilitates teacher participation in experience-sharing,

learning, and professional development activities within digital environments, thereby contributing to a school culture of innovation and continuous learning.

4. Conclusion

Amidst the rapid digital transformation of education, digital competence in teaching has become a crucial professional skill for high school teachers. This competence plays a decisive role in the ability to effectively utilize and integrate digital technologies to innovate teaching, testing, and assessment activities, as well as to foster student competence development. Consequently, managing the development of teachers' digital competence in teaching is an essential requirement for today's high schools.

Drawing on domestic and international theoretical perspectives regarding digital competence, its development, and the management thereof, this article defines the structure of high school teachers' digital competence in teaching. It also outlines the content of managing this development across four fundamental functions: planning, organizing, directing, and monitoring/evaluating.

Based on this framework, the article proposes five management measures to develop digital competence in teaching for high school teachers in Hanoi, Vietnam: (1) formulating teacher digital competence development plans aligned with practical needs; (2) organizing differentiated digital competence training linked to professional activities; (3) establishing a digital learning environment and community within the school; (4) directing teachers to integrate digital technology into the design, organization, and assessment of teaching activities; and (5) innovating testing and assessment methods while fostering motivation for digital competence development. These measures are interconnected and mutually supportive, aiming for the continuous and sustainable development of digital competence in alignment with the practical requirements of the school.

The research findings contribute to the theoretical foundation and propose management directions for developing high school teachers' digital competence in teaching within the context of educational digital transformation. However, to verify the feasibility and effectiveness of the measures, further empirical studies in high schools across different locations are required.

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Conflict of Interest Statement

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