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Solutions to Enhance the Competence of Integrating Information Technology and Digital Communication in University Teaching Activities in the Context of Educational Digital Transformation

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ABSTRACT: This paper analyzes the role, components, and current status of university lecturers' competencies in integrating information technology (IT) and digital communication within the context of educational digital transformation in Vietnam. The study employs a mixed-methods design, including a literature review, interviews, and a formal survey of 248 participants at Saigon University; the measurement scale demonstrated high reliability (Cronbach's alpha = 0.92). Results indicate that competencies for IT integration and digital communication range from moderate to fairly good. Lecturers possess technical foundations and exhibit some strong practices (such as preparing digital lessons and organizing group interactions) but show substantial heterogeneity and a lack of depth in IT. Major limitations include guiding students to produce digital products, designing reliable online assessments, providing rapid feedback using technology, and leveraging learning data to adjust instruction. A gap analysis between "necessary" and "feasibility" for proposed solutions shows high desire for implementation but limited confidence in their practicability (average gap = 0.24), especially for solutions requiring governance frameworks, infrastructure, and organizational commitment. The author proposes an integrated solution framework: developing digital competency standards and practice-oriented training pathways with product-focused activities and technical coaching; prioritizing easily deployable solutions as leverage while steering larger initiatives; strengthening infrastructure, security policies, and governance; establishing monitoring, evaluation, and incentive systems; and integrating learning-process analytics into pedagogical practice. Finally, the study's findings emphasize the need for a comprehensive, coordinated approach across people, technology, and policy to ensure effective and equitable educational digital transformation.

KEYWORDS: Digital competencies; IT integration; Digital communication; Educational digital transformation

1. INTRODUCTION

In the context of globalization and the rapid development of science and technology, digital transformation is reshaping the higher education system and imposing new demands on the competencies of teaching staff. Higher education must not only deliver specialized knowledge but also adapt to more multichannel, flexible, and personalized teaching and learning methods to meet the needs of the global labor market and the expectations of the digital age. In Vietnam, the orientation toward educational reform was affirmed in Prime Ministerial Decision 749/NQ-TTg dated June 3, 2020, which set out the strategy, objectives, tasks, and solutions for implementing comprehensive digital transformation in Vietnam through 2025 as a foundation for broader goals toward 2030. At the same time, higher education renewal must ensure practicality, effectiveness, and coherence, underscoring the necessary of improving the quality of the teaching workforce to align with international standards. In the course of digital transformation, teachers' competencies need to expand beyond traditional professional qualifications; prominently among these are the competencies to integrate information technology (IT) and to engage in digital communication (Le Chi Lan et al., 2023). These competencies include the ability to proficiently use digital tools, design teaching–learning activities on digital platforms, interact with and guide learners through online channels, while maintaining emotional connection and pedagogical responsibility in virtual environments. Previous studies have shown that IT integration and the use of digital communication methods can enhance teaching effectiveness, promote learning interaction, and support formative assessment. However, many teachers remain insufficiently prepared—both technically and pedagogically—to implement these approaches effectively (Đang Thanh Hung, 2012; Honga et al., 2008).

The paper focuses on analyzing the concept, components, and role of the competency to integrate information technology (IT) and digital communication in the teaching activities of university lecturers; assessing the current status of the development of this competency in the context of educational digital transformation in Vietnam; and proposing an evaluation framework and suitable development solutions. The study's objectives are to identify the essential competencies that lecturers need, effective methods of training and support, as well as policy and organizational measures to promote sustainable IT adoption. The research findings will contribute to building theoretical and practical frameworks to support higher education institutions in enhancing lecturers' IT integration and digital communication competencies, thereby helping to successfully implement the education digital transformation strategy and improve the quality of professional development in the context of international integration. Based on the assessment results, the study will propose solutions to strengthen university lecturers' IT integration and digital communication competencies. The research will focus on answering the following questions: What

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is the current status of university lecturers' IT integration and digital communication competencies in the context of digital transformation? What solutions can be applied to develop these competencies effectively? The study contributes to creating a theoretical framework for lecturer competency development, which will help universities design appropriate training programs and improve education quality in the context of digital transformation.

2. RESEARCH METHODS

The study was conducted using a mixed-methods design, combining qualitative and quantitative approaches to ensure both analytical depth and statistical reliability for proposing solutions to develop university lecturers' competencies in IT integration and digital communication. This design allows for drawing on diverse data sources from school practice, experts, and learners, while also testing the necessity and feasibility of the proposed solutions.

The primary objective of the research is to investigate the extent to which lecturers' competencies in IT integration and digital communication are realized in teaching activities within the context of educational digital transformation, and from that basis to propose training, organizational, and policy solutions to enhance these competencies for university lecturers in general and for Saigon University in particular.

The research procedure was designed as a sequence of iterative steps to ensure scientific rigor and practical relevance. Beginning with a theoretical review and systematization of studies related to IT integration and digital communication, the author constructed the competency framework for IT integration and digital communication with constituent competency items as the basis for the measurement scale. The preliminary model was refined through semi-structured interviews with three experts (an IT lecturer, an administrative manager, and an educational technology specialist). Interview discussions focused on the completeness of the competency items, the necessary and feasibility of implementation, and suggested solutions related to the IT integration and digital communication competencies.

The adjusted scale was pilot-tested on 30 individuals (10 managers and lecturers, and 20 students) to evaluate item clarity, the survey structure, and preliminary reliability. Pilot results were used to remove or revise inappropriate items and to optimize the scale structure. The main survey focused on the current status of IT integration and digital communication in teaching activities within the context of educational digital transformation was conducted from September to November 2025. Data were collected from 248 participants at Saigon University, including 20 managers, 78 lecturers, and 150 students. After analyzing the current situation, the study obtained research results and proceeded to test the proposed measures from January to February 2026.

The study assessed reliability using Cronbach's Alpha to ensure the validity and reliability of the measurement scale, combined with data-analysis methods such as descriptive statistics, comparison of means, standard deviation, etc. The research analyzed the current status of lecturers' competencies in IT integration and digital communication in teaching within the context of digital transformation; based on the analysis results, the author proposed solutions to enhance these competencies in teaching activities under digital transformation.

Data from the survey were processed using SPSS 24.0. The survey employed a 5-point Likert scale to evaluate the current status of lecturers' IT integration and digital communication competencies in teaching under digital transformation, with 1 = very low attainment and 5 = very high attainment. Proposed solutions were rated on a 5-point scale for necessary/feasibility, with 1 = not necessary/not feasible and 5 = very necessary/very feasible. Using the 5-point scale, the interval was calculated as (Maximum – Minimum)/n = (5–1)/5 = 0.8. Accordingly, mean values were interpreted according to Table 1 as follows:

Table 1: Convention for processing assessment data and testing necessary/feasibility

$1.0 \leq$ Mean < 1.8	$1.8 \leq$ Mean < 2.6	$2.6 \leq$ Mean < 3.4	$3.4 \leq$ Mean < 4.2	$4.2 \leq$ Mean ≤ 5.0
Weak	Least	Average	Rather	Good
Very Unnecessary	Not necessary	Undecided	Necessary	Very Necessary
Very Unfeasible	Not Feasible	Undecided	Feasible	Very Feasible

The Cronbach's Alpha reliability test reached 0.92 across a total of 72 items, indicating that the questionnaire has good reliability and can be used to analyze the current situation and propose solutions for the study. Mean values were interpreted according to the established convention, ensuring objective and accurate result interpretation. These analytical methods were selected on a scientific basis to enhance the study's reliability and value.

3. RESEARCH FINDINGS

3.1. The current state of IT integration and digital communication in teaching activities in the context of educational digital transformation

IT integration and digital communication in teaching in Vietnam have made clear progress but still face many challenges regarding teacher competencies, infrastructure, IT design, assessment, and equitable access. Developing comprehensive solutions should focus on intensive professional development, technical support, standardization of digital content quality, incentive mechanisms, and policies ensuring access rights and data security (Ninh Thi Kim Thoa, 2022).

3.1.1. IT integration in teaching activities

IT integration in teaching is an intentional process that centers pedagogical objectives and uses technology to increase interactivity, personalization, and the effectiveness of learning management (Cyprian et al., 2019). When implemented according to pedagogical design principles, supported by professional development and appropriate infrastructure, IT integration helps improve teaching quality and expand access to education (Le Chi Lan, 2024).

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Table 2: Current status of lecturers' competencies in IT integration for teaching activities

Code	Item	Managers & Lecturers		Students		Total	
		Mean	SD	Mean	SD	Mean	SD
THCN1	Use digital technologies to support teaching, store, preserve, and exploit data using modern devices for research	3.56	0.83	3.50	0.86	3.52	0.84
THCN2	Interact, communicate, and collaborate in research through digital technologies; use IT networks to reach experts for learning and experience sharing	3.33	0.91	3.47	0.89	3.41	0.90
THCN3	Establish effective communication channels that easily connect with learners	3.43	0.79	3.46	0.82	3.45	0.80
THCN4	Create study groups on social networks to encourage discussion and collaboration	3.09	1.06	3.59	0.93	3.40	1.01
THCN5	Guide learners to use online tools to create content, thereby improving communication skills	3.01	1.14	3.38	1.01	3.23	1.07
THCN6	Connect with other lecturers to exchange experience and teaching methods via specialized platforms	3.12	1.00	3.53	0.86	3.37	0.93
	Overall average	**3.26**	**0.95**	**3.49**	**0.89**	**3.40**	**0.93**

The mean score related to teachers' IT integration competence in teaching was 3.40 (SD = 0.93), which is at a fairly good level. This indicates that teachers' IT integration competence has exceeded the average level, but is not yet truly strong or consistent. Other strengths include the ability to integrate digital tools into lessons and organize group interaction (THCN1: 3.52, SD = 0.84; THCN3: 3.45, SD = 0.80), reflecting relatively solid infrastructure and basic skills. However, several key aspects of IT application remain limited, such as guiding students to create digital products (THCN5: 3.23, SD = 1.07), designing reliable online assessments (THCN4: 3.40, SD = 1.01), encouraging students to create digital tools to solve problems (THCN2: 3.41, SD = 0.90), and exploiting learning data to adjust teaching methods (THCN6: 3.37, SD = 0.93). These results show only an average level of attainment, with fairly large variation in opinions. Interviews with administrators suggested that the main causes are that technical investment has not gone hand in hand with the development of IT competence, there is a lack of competency standards and mandatory professional development pathways, and technical processes/support remain inadequate. As a result, technology-based assessment, feedback, and learning analytics practices are still fragmented and inconsistent, leading to unequal digital learning experiences among students.

From the above analysis, several factors can be identified as limiting teachers' IT integration competence in teaching: (1) First, investment in infrastructure and basic technical facilities may already have been made, creating a foundation for the use of digital technology in teaching, storage, preservation, and exploitation of data based on modern devices serving research purposes, as well as establishing effective communication channels and facilitating connections with learners (THCN1 and THCN3). However, investment in IT competence, interactive lesson design, and digital product creation has not been proportionate. (2) Second, there is a lack of an internal digital competency standards framework, leading each teacher to develop independently or self-learn, which creates inconsistency. (3) Third, policies, regulations, and incentives to promote professional collaboration through digital platforms are still weak, so those with good experience have limited opportunities to scale up and share their practices. (4) Finally, psychological barriers and concerns about data safety and copyright on social media make some teachers hesitant to implement informal interactive learning approaches. In summary, teachers' IT integration competence is in a transitional stage, showing that teachers have a foundation and that some aspects have reached a fairly good level, but significant disparities and important gaps remain in IT competence and professional collaboration. A comprehensive plan is needed, including competency standards, practice-based training with technical consultation, policies encouraging sharing, and digital risk governance, in order to transform this transitional state into a consistent, sustainable competence that genuinely enhances student learning outcomes.

3.1.2. Digital communication in teaching activities

Digital communication is a foundational factor in ensuring teaching quality in digital environments. When it is intentionally designed, consistently implemented, and supported by appropriate skills, processes, and tools, digital communication helps build learning communities, enhance interaction, and improve learning outcomes (Nguyen Tan Dai et al., 2018)."

Table 3. Current status of teachers' digital communication competence in teaching activities

Code	Item	Managers & Lecturers		Students		Total	
		Mean	SD	Mean	SD	Mean	SD
GTSO1	Designing and sharing lessons using digital tools to promote communication and collaboration in digital technology environments	3.17	1.01	3.79	0.82	3.55	0.95
GTSO2	Encouraging learners to create their own digital tools to support learning and help them identify technological solutions to problems	3.19	1.03	3.77	0.81	3.54	0.95

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Code	Item	Managers & Lecturers		Students		Total	
		Mean	SD	Mean	SD	Mean	SD
GTSO3	Flexibly using digital tools to help learners interact and conduct research together	3.54	0.81	3.73	0.76	3.65	0.78
GTSO4	Creating multiple-choice, essay, and open-ended questions through online assessment tools	3.54	0.80	3.73	0.77	3.66	0.78
GTSO5	Using technology to provide prompt feedback after each test or assignment	3.22	0.88	3.63	0.77	3.47	0.84
GTSO6	Using data analysis tools to monitor learners' progress and adjust teaching methods accordingly	3.36	0.82	3.54	0.86	3.47	0.85
	Overall average	**3.34**	**0.89**	**3.70**	**0.80**	**3.56**	**0.86**

Overall, teachers' digital communication competence in teaching was rated at a fairly good level based on the combined assessment (overall Mean = 3.56, SD = 0.86). Students gave higher ratings than teachers themselves (students = 3.70 compared with administrators/teachers = 3.34), suggesting that teachers may perceive their own limitations more strongly than is reflected in practice, or that students have had relatively positive experiences with digital tools. The average standard deviation (~0.8–1.03) indicates an acceptable level of agreement, although there is still considerable variation in some criteria. The criteria related to digital interaction and online assessment (GTSO3, GTSO4) appear to be strengths, as both teachers and students rated them at a fairly good level, with relatively small differences in mean scores, indicating that competence in interaction and online assessment design is relatively stable and widely recognized. In contrast, designing and sharing digital lessons, encouraging students to create their own digital tools, providing prompt feedback, and using learning analytics (GTSO1, GTSO2, GTSO5, GTSO6) received lower scores or showed greater variation. In particular, GTSO1 and GTSO2 had SD values greater than 1.0 in the administrators/teachers group, reflecting inconsistency in competence or implementation across individuals.

Based on these observations, priority should be given to solutions aimed at improving and standardizing competence through short-term professional development in digital lesson design, digital pedagogy, and learning analytics; developing a digital competency standards framework and an internal certification system; providing platforms, lesson templates, and automated feedback tools; and promoting the sharing of good practices and technical mentoring among teachers. At the same time, it is necessary to investigate the causes of this variation, such as differences across faculties, age groups, and IT proficiency levels, and to collect additional evidence from practice, including classroom observation and analysis of digital teaching products, in order to adjust support policies accordingly. In summary, teachers' digital communication competence is currently at a fairly good level, but there remain gaps and disparities that need to be addressed. Targeted interventions in training, tool standardization, and peer sharing will help improve the effectiveness of digital teaching and foster greater consensus across the teaching staff.

3.2. Solutions for improving IT integration competence and digital communication in teaching activities in the context of educational digital transformation

For the proposed solutions to be effective, they must combine investment in infrastructure and technology, in-depth and continuous professional development for teachers, appropriate evaluation and incentive mechanisms, vibrant communities of practice, and clear change management. Implementation should begin with high-impact interventions, such as technical support, and then gradually expand along a roadmap monitored by data to ensure sustainability and equity (Balyk et al., 2020).

After completing the assessment of the current situation, the study conducted a pilot survey from January to February 2026, collecting data from 189 participants (20 administrators, 90 teachers, and 79 students) at Saigon University.

3.2.1. Solutions for improving IT integration competence in teaching activities

Improving IT integration competence in teaching and learning requires a comprehensive set of solutions, ranging from strategy, practice-based professional development, infrastructure, and tools, to evaluation mechanisms, student support, and the promotion of a culture of innovation. Implementation should follow a roadmap that prioritizes high-impact interventions, such as training core teachers and providing technical support, thereby creating a foundation for scaling up and sustaining digital transformation in a durable manner (Chan et al., 2017).

Table 4. Urgency and feasibility of solutions to improve teachers' IT integration competence in teaching activities

Code	Item	Necessary		Feasibility		Difference of mean value
		Mean	SD	Mean	SD	
GP.Tichhop.1	Creating opportunities for teachers to participate in collaborative projects with other institutions, thereby enhancing communication and collaboration through digital technology	3.92	0.74	3.57	0.68	0.35
GP.Tichhop.2	Guiding teachers in the use of tools for shared project management so that stakeholders can coordinate effectively	3.89	0.73	3.58	0.69	0.31

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Code	Item	Necessary		Feasibility		Difference of mean value
		Mean	SD	Mean	SD	
GP.Tichhop.3	Organizing training courses to develop communication skills in digital environments in order to improve collaboration effectiveness	3.83	0.70	3.46	0.63	0.38
GP.Tichhop.4	Encouraging teacher groups to use platforms such as Google Meet or Zoom to collaboratively develop teaching projects	3.90	0.71	3.44	0.64	0.46
GP.Tichhop.5	After each meeting or group project, requiring teachers to share feedback and lessons learned	3.60	0.68	3.90	0.70	0.30
	Overall average	**3.83**	**0.71**	**3.59**	**0.67**	**0.24**

Results of Table 4: The solutions for improving teachers' IT integration competence in teaching were assessed as necessary (average Mean = 3.83, SD = 0.71) and feasible (feasibility Mean = 3.59, SD = 0.67). However, the implementation perception gap (0.24) indicates that the desire to carry out these solutions is higher than confidence in their actual implementation. Specifically, the solutions promoting inter-institutional collaboration and developing digital communication skills (GP.Tichhop.1 to GP.Tichhop.4) were considered highly necessary (Mean ranging from 3.83 to 3.92), but they also showed relatively large gaps between necessary and feasibility (with the largest gap of 0.46 for the use of Google Meet/Zoom). This reflects concerns related to resources, infrastructure, time, and the capacity to manage online sessions. Meanwhile, a simple and low-cost solution such as requiring teachers to share feedback and lessons learned after each project (GP.Tichhop.5) was rated as more feasible than necessary (gap = -0.30), suggesting that interventions that are easy to implement can quickly create a spillover effect.

The strategic priority of this solution set is therefore to combine immediate action with a practical implementation plan: first, to deploy easy and effective measures that help build a culture of sharing and strengthen confidence; and at the same time, to gradually institutionalize larger collaborative initiatives by ensuring adequate resources, policy frameworks, and technical support (including infrastructure, digital project management training, and security standards) in order to narrow the gap between necessary and feasibility before scaling up.

3.2.2. Solutions to strengthen digital communication competence in teaching activities

Enhancing digital communication competence requires a comprehensive set of solutions, such as practice-based professional development, clear rules and guidelines, the design of activities that encourage meaningful communication, technological support, continuous assessment, and the cultivation of a professional digital culture (Nguyen Thi Thu Van, 2021). When strategically implemented and measured through data, digital communication will become an important driver for improving teaching quality in the digital era.

Table 5. Necessary and feasibility of solutions to strengthen digital communication competence in teaching activities

Code	Item	Necessary		Feasibility		Difference of mean value
		Mean	SD	Mean	SD	
GP.Giaotiep.1	Creating opportunities for teachers and learners to co-develop learning content through online tools such as Google Slides, AI tools, and others	3.91	0.72	3.63	0.70	0.28
GP.Giaotiep.2	Establishing a system through which learners can provide feedback to teachers via online platforms in order to enhance interaction.	3.92	0.72	3.63	0.71	0.30
GP.Giaotiep.3	Encouraging the use of mobile applications that help teachers connect more easily with learners.	3.87	0.74	3.53	0.69	0.34
GP.Giaotiep.4	Establishing official IT-based communication procedures between teachers and learners to ensure that information is conveyed clearly and effectively.	3.87	0.73	3.35	0.66	0.52
GP.Giaotiep.5	Applying tools to monitor and evaluate communication effectiveness.	3.64	0.70	3.89	0.74	0.25
	Overall average	**3.84**	**0.72**	**3.61**	**0.70**	**0.24**

Results of Table 5: The solutions aimed at strengthening digital communication competence were assessed as necessary (average Mean = 3.84, SD = 0.72) and feasible (feasibility Mean = 3.61, SD = 0.70). However, the average gap of 0.24 between necessary and feasibility suggests that the desire to

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implement these solutions is stronger than confidence in their actual implementation. Specifically, solutions that facilitate interaction and collect online feedback (GP.Giaotiep.1: 3.91/3.63; GP.Giaotiep.2: 3.92/3.63) were considered highly necessary and fairly feasible. Encouraging the use of mobile applications received a similar evaluation (GP.Giaotiep.3: 3.87/3.53), though with somewhat greater concern about implementation. In contrast, establishing formal communication procedures on IT platforms (GP.Giaotiep.4: 3.87 for necessary vs. 3.35 for feasibility, gap = 0.52) showed the largest discrepancy, reflecting practical concerns regarding legal frameworks, information governance, infrastructure, and organizational commitment. Meanwhile, the solution of measuring and adjusting communication effectiveness (GP.Giaotiep.5) was regarded as more feasible than necessary (3.64 vs. 3.89, gap = 0.25), implying that this is a technically easy intervention to implement but has not yet been viewed as a strategic priority.

Based on these data, three main limitations can be identified: (1) the gap between perceived necessary and implementation capacity, especially evident in GP.Giaotiep.4, reflects the lack of policies, procedures, and organizational commitment needed to standardize digital communication; (2) the relatively even dispersion of opinions (SD ranging from 0.66 to 0.74) suggests that solutions should be adapted to the context of digital transformation and individual competence levels; and (3) some technically easy-to-implement solutions, such as monitoring and evaluating communication, have not been prioritized strategically and therefore are unlikely to generate system-wide impact. It is therefore necessary to immediately deploy feedback tools and interactive platforms (GP.Giaotiep.1 to GP.Giaotiep.3) to create momentum. At the same time, formal communication procedures should be guided by a governance framework, security guidelines, and a professional development roadmap in order to narrow the gap between necessary and feasibility before scaling up.

4. CONCLUSION

The findings indicate that teachers' IT integration and digital communication competencies remain at a transitional stage, characterized by a basic technical foundation and several promising practices, yet marked by inconsistency and insufficient pedagogical depth. Indicators related to the use of digital tools in lesson preparation and the organization of interaction (THCN1, THCN3 / GTSO1, GTSO3) reached a fairly good level, suggesting that basic infrastructure and routine application practices have already been established. However, the core competencies required for effective digital transformation in education—such as guiding students in creating digital products, designing reliable online assessments, providing prompt technology-mediated feedback, and using learning analytics to adapt teaching—remain only at an average to near-good level and show substantial variation across respondents, as reflected in the relatively high standard deviations. The relationship between the perceived necessary and feasibility of the surveyed solutions further reveals a strong desire for implementation but limited confidence in actual execution (average gap = 0.24), especially for solutions requiring governance frameworks, stable infrastructure, and organizational commitment, such as establishing formal communication procedures, promoting inter-institutional collaboration, and organizing large-scale online meetings. These results point to a mismatch between infrastructure investment and IT competency development; unless this imbalance is addressed, digital transformation in education is likely to generate unequal benefits for learners and may fail to achieve sustainable impact.

Improving teachers' IT integration and digital communication competencies in the context of educational digital transformation therefore requires a comprehensive, coordinated, and practice-oriented approach. Investment in institutional strategy and policy—particularly stable technical infrastructure and professional support systems—constitutes an essential foundation. On that basis, continuous professional development, guided practice, technical consultation, and communities of practice can effectively strengthen teachers' technical skills, IT competence, and digital communication capacity. Standardizing procedures, evaluation criteria, and the use of learning analytics will provide a data-based foundation for measurement, adjustment, and equitable access. At the same time, efforts to enhance teachers' IT integration and digital communication competencies should incorporate personalized feedback and the design of interactive learning activities in order to improve students' learning experiences. In addition, attention should be given to change management, incentive mechanisms, and organizational learning culture, as these factors are central to ensuring that solutions are accepted, scaled up, and sustained over time. When human, technological, and policy dimensions are integrated harmoniously, teachers will be better equipped to enact pedagogical transformation, thereby improving the effectiveness of professional development and contributing to the realization of digital transformation goals in higher education.

To ensure that digital transformation in education is genuinely effective and equitable, universities need to adopt a coordinated approach: standardizing competencies, providing practice-based professional development with technical mentoring, strengthening infrastructure and governance policies, and beginning with easily implementable solutions to build momentum while simultaneously institutionalizing more complex initiatives. Only when both the technical and pedagogical dimensions are developed in parallel and supported by appropriate mechanisms can teachers' IT integration and digital communication competencies become a sustainable driving force for teaching quality.

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