Assessing Digital Competencies and Readiness Among Vietnamese Educators: A Cross-Sectional Study

Ha Le Nguyen[1], Loan Thi Bui[2,*], Hang Thi Thuy Vu[3] &Cuong Van Trinh[4]

[1]Quy Nhon University, Gia Lai Province, Vietnam

[2]University of Transport Technology, Hanoi, Vietnam

[3]University of Education, Vietnam National University Hanoi, Hanoi, Vietnam

[4]Hung Vuong University, Phu Tho Province, Vietnam

*Correspondence: University of Transport Technology, Hanoi, Vietnam. E-mail: buithiloan@hvu.edu.vn

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Abstract

Digital transformation in education is an important process that requires educators to develop new knowledge, skills, and attitudes. This study aimed to assess the current awareness, digital competence, training practices, and implementation of digital transformation tasks among managers, teachers, and lecturers in Binh Dinh Province, Vietnam. A descriptive research design with a quantitative approach was used. The sample included 290 educators selected through purposive sampling. Data were collected with a structured questionnaire and analyzed using descriptive statistics. The results showed that awareness of the concept of digital transformation was moderate, with 48.28% of participants reporting a moderate level of understanding and a mean score of 3.24. However, understanding of the practical application and impact was lower, with a mean of 2.07 for understanding and applying digital technologies. Regarding digital competence, educators demonstrated higher skills in using computers and technological devices (M = 3.01) and educational software (M = 2.93). Skills in information security and data safety were weaker, with the lowest mean score of 2.51. Training activities were implemented at a moderate level, with organizing workshops and training sessions receiving the highest mean score (M = 2.52), while providing regular support and materials had a lower mean (M = 2.04). The study also found that developing programs to guide learners had the highest implementation (M = 2.87), but guiding students on information safety and digital ethics was less developed (M = 2.40). These findings suggest that while efforts to support digital transformation have started, more actions are needed to improve digital skills, awareness, and institutional support. The study offers important insights for policymakers and educators to design effective training and strategies for digital transformation.

Keywords: digital transformation, digital competence, technology, education, Vietnam

1. Introduction

Digital transformation in education has emerged as a crucial initiative in many countries, including Vietnam. This transformation encompasses not only the adoption of modern technologies but also a fundamental shift in the mindset, methodologies, and skills of educators and administrators. The integration of digital technologies into education involves more than simply providing access to tools; it requires overcoming various external barriers (such as resources and infrastructure) as well as internal challenges (including mindset, attitudes, and skills). Educators often face difficulties stemming from inadequate professional development, time constraints, and resistance to change. Successful digital transformation necessitates institutional support and a reimagining of pedagogical practices (Bećirović, 2023). The cultivation of digital competencies among teachers and educational personnel is vital for achieving effective digital transformation. Garry Falloon's framework underscores the notion that digital competence extends beyond mere technical skills; it also encompasses ethical, pedagogical, and attitudinal aspects. Teacher education must embrace comprehensive approaches that equip educators to critically engage with digital tools and integrate them meaningfully into their teaching practices (Falloon, 2020). Without sufficient skills and knowledge, the implementation of digital tools in teaching and administration will encounter numerous challenges and limitations. A

thorough literature review indicates that digital transformation in schools is a multifaceted process involving cultural, organizational, and operational changes. It requires not only the necessary infrastructure but also the development of digital competencies among staff. The review emphasizes that without adequate digital capacity, schools face significant obstacles in achieving successful transformation (Falloon, 2020).

Digital competence transcends the mere operation of digital devices and encompasses a comprehensive array of knowledge, skills, and attitudes. This includes the selection and evaluation of digital resources, ensuring data security, and exhibiting effective communication online. The European Union defines digital competence as the critical and responsible utilization of digital technologies for learning, professional environments, and civic participation (Mattar et al., 2022). According to the European Framework for the Digital Competence of Educators (DigCompEdu), digital competence comprises six primary areas: professional engagement, digital resources, teaching and learning, assessment, empowering learners, and facilitating the development of learners' digital competence (Cabero-Almenara et al., 2021). Research utilizing the DigCompEdu framework in teacher training contexts, particularly in Spain, indicates that educators frequently require additional support in areas such as digital security and the pedagogical integration of technology. These findings underscore the necessity for comprehensive training that aligns with the framework to equip educators with the capability to effectively teach and exemplify digital competence (García-Vandewalle García et al., 2023).

In Vietnam, the government has implemented several policies to advance digital transformation in education. One notable initiative is Decision No. 131/QĐ-TTg, which outlines the national strategy for digital transformation in the education sector from 2022 to 2025. This policy aims to modernize teaching and learning practices while enhancing educational management systems (Do et al., 2023). Despite the existence of coherent national policies, many educational institutions in Vietnam encounter significant barriers to successful implementation. Challenges include limited ICT infrastructure, inadequate professional development opportunities for educators, and low levels of digital awareness. These issues are particularly severe in provinces with fewer resources and less institutional support (Do et al., 2023). Research indicates that there are both external barriers (such as infrastructure, resources, and administrative support) and internal barriers (including educator attitudes, confidence, and digital skills) that impede effective technology integration. Teachers frequently lack the time, training, and support necessary to meaningfully adopt digital tools, which in turn hampers the development of digital competencies (Bećirović, 2023).

Binh Dinh Province in Central Vietnam has made progress in adopting digital tools, but the readiness and skill levels of teachers and managers remain unclear. This study aims to assess the current state of digital competencies among educators in selected institutions in Binh Dinh Province. It focuses on their perceptions, levels of skills and knowledge, and participation in training programs related to digital transformation. The research also investigates the existing policies and institutional support provided to improve digital capacities. By understanding these aspects, this study contributes to identifying the strengths and weaknesses of the current system. The results can inform policymakers, school leaders, and training providers about the specific needs of educators. Moreover, the findings may help design more effective programs and policies to support educators in building their digital competencies. This is essential for promoting a modern and inclusive educational environment that meets the needs of learners in the digital age.

2. Methods

2.1 Research Design

This study employed a descriptive research design to evaluate the digital competencies of educators in various educational institutions within Binh Dinh Province, Vietnam. A quantitative approach was utilized for the collection and analysis of data.

2.2 Research Sample

The sample comprised teachers, lecturers, and educational managers from various types of institutions, including public high schools, vocational training centers, colleges, and universities located in Binh Dinh Province. Participants were selected through purposive sampling to ensure that they possessed relevant experience in teaching and utilizing digital tools. A total of 290 educators, encompassing managers, lecturers, and teachers, participated in the study. The sample included three main groups of participants: educational managers, lecturers, and teachers. Managers were defined as individuals holding administrative or leadership roles at institutional or departmental levels, while lecturers and teachers referred to academic staff directly involved in teaching activities at colleges, universities, vocational centers, and high schools. This diverse composition allowed the study to capture multiple perspectives on digital transformation from both managerial and instructional roles within the education system.

2.3 Data Collection Tools

Data was gathered through a structured questionnaire designed by researchers. The questionnaire consisted of two primary sections: Personal Information, which included age, gender, position, and years of work experience, and Perception of Digital Transformation, which focused on attitudes and awareness regarding the significance of digital technology in education. Each item in the questionnaire utilizes appropriate Likert scales for responses.

2.4 Data Collection Procedure

Data collection occurred between October 2024 and December 2024. Initially, the research team reached out to the leaders of the institutions to request permission and clarify the study's objectives. Subsequently, questionnaires were distributed to participants during meetings and training sessions. Participation was entirely voluntary, and all respondents were assured of the confidentiality of their responses.

Table 1. Demographic of Participants (N = 290)

Place	*n*	*%*
Quy Nhon City	75	26%
An Nhon Town	30	10%
Hoai Nhon Town	25	9%
Tay Son District	20	7%
Hoai An District	20	7%
An Lao District	15	5%
Vinh Thanh District	15	5%
Van Canh District	15	5%
Phu My District	25	9%
Phu Cat District	25	9%
Tuy Phuoc District	25	9%
Total	*290*	*100%*

Table 1 presents the demographic distribution of participants across different locations. The largest proportion of participants resided in Quy Nhon City (n = 75), accounting for 26% of the sample. An Nhon Town contributed 10% (n = 30) of the participants. Hoai Nhon Town comprised 9% (n = 25), similar to Phu My District, Phu Cat District, and Tuy Phuoc District, each representing 9% of the total sample. Tay Son District and Hoai An District both had 7% of participants (n = 20 each). An Lao District, Vinh Thanh District, and Van Canh District each accounted for 5% of the participants (n = 15).

2.5 Data Analysis

Quantitative data obtained from the questionnaires were analyzed through descriptive statistics, including frequencies, percentages, and means. These findings provided insight into the overall level of digital competencies and perceptions among educators. To facilitate interpretation, mean scores were examined using a relative reference framework based on the Likert-scale structure. Mean values closer to the upper range were interpreted as indicating stronger implementation or higher competence, whereas values near the midpoint reflected moderate levels, and lower mean scores suggested limited development. This approach allows for a more meaningful comparison across dimensions rather than interpreting individual means in isolation.

2.6 Ethical Considerations

The study adhered to ethical research standards. All participants were informed about the objectives, procedures, and their rights. Informed consent was secured prior to data collection. The researchers ensured the confidentiality of all data and utilized it solely for research purposes. Additionally, this study received approval from Quy Nhon University on April 19, 2024 (no. T2024.852.23).

3. Results

Table 2 shows the current awareness of managers, teachers, and lecturers about the necessity of digital transformation in educational and training activities. Regarding understanding of the concept of digital transformation, most

participants reported a moderate level (48.28%), while 24.14% indicated much, and 10.34% indicated very much understanding. The mean score for this item was 3.24, reflecting a relatively higher awareness compared to other items. For understanding the role and importance of digital transformation, 44.83% selected moderate, 27.59% selected much, and 14.48% selected very much. The mean score was 2.41. In terms of understanding the impact of digital transformation, 46.55% of respondents reported a moderate level, while 24.14% reported much, and 13.10% reported very much understanding. The mean score was 2.30. Finally, understanding and application of digital technologies showed lower awareness, with 41.38% indicating moderate, 20.69% indicating much, and 10.34% indicating very much understanding. The mean score for this item was 2.07, which was the lowest among all areas assessed.

Table 2. Current Awareness of Managers, Teachers, and Lecturers Regarding the Necessity of Digital Transformation in Educational and Training Activities (N = 290)

Items		*Level*					*Mean*
		Very little	*Little*	*Moderate*	*Much*	*Very much*	
Understanding of the concept of digital transformation	n	10	40	140	70	30	3.24
	%	3.45	13.79	48.28	24.14	10.34	
Understanding of the role and importance of digital transformation in education and training	n	8	30	130	80	42	2.41
	%	2.67	10.34	44.83	27.59	14.48	
Understanding of the impact of digital transformation in education and training	n	12	35	135	70	38	2.30
	%	4.14	12.07	46.55	24.14	13.10	
Understanding and application of digital technologies in education and training	n	20	60	120	60	30	2.07
	%	6.90	20.69	41.38	20.69	10.34	

Table 3. Current Status of Digital Competence and Knowledge of Teachers, Lecturers, and Educational Managers (N = 290).

Items		*Level*				*Mean*
		Weak	*Average*	*Good*	*Excellent*	
Ability to use computers and technological devices in teaching and management work	n	30	80	110	70	3.01
	%	8.62	21.38	30.34	39.66	
Ability to use educational software and digital tools to support teaching (Zoom, Google Meet, Microsoft Teams, etc.)	n	20	60	130	80	2.93
	%	6.9	20.69	44.83	27.59	
Ability to design electronic lessons and digital learning materials	n	15	70	120	85	2.74
	%	14.83	25.86	30.00	29.31	
Proficiency in utilizing open educational resources (OER) and digital learning repositories	n	25	90	110	65	2.81
	%	8.62	30.69	32.07	28.62	
Ability to use learning management systems (LMS) to support teaching	n	40	80	100	70	2.69
	%	13.79	27.59	34.48	24.14	
Competence in information security and data safety in the digital environment	n	18	65	125	82	2.51
	%	18.62	32.41	27.93	21.03	
Ability to guide and support learners in using digital technologies for learning	n	35	105	80	70	2.64
	%	12.07	36.21	27.59	24.14	
Level of self-study and updating of digital technology knowledge for teaching and management	n	30	85	95	80	2.78
	%	10.4	29.31	32.76	27.59	

Table 3 describes the current status of digital competence and knowledge among teachers, lecturers, and educational managers (N = 290). The ability to use computers and technological devices in teaching and management work had the highest mean score (M = 3.01). In this area, 39.66% rated their competence as excellent, and 30.34% as good. The ability to use educational software and digital tools such as Zoom, Google Meet, and Microsoft Teams showed a mean score of 2.93, with 44.83% reporting good competence and 27.59% reporting excellent. The ability to design electronic

lessons and digital materials had a mean of 2.74. About 30.00% indicated good competence, and 29.31% indicated excellent.

Proficiency in utilizing open educational resources and digital learning repositories had a mean of 2.81. In this area, 32.07% rated their skills as good, and 28.62% as excellent. The ability to use learning management systems (LMS) presented a lower mean score of 2.69, with 34.48% indicating good competence and 24.14% excellent. Competence in information security and data safety had the lowest mean (M = 2.51), with 27.93% reporting good competence and 21.03% excellent. The ability to guide and support learners in using digital technologies also had a low mean of 2.64. Finally, the level of self-study and updating digital knowledge was moderate, with a mean of 2.78 and 32.76% reporting good competence.

Table 4. Current Status of Digital Competence Training and Development in Educational and Training Institutions (N = 290)

Items		*Level*					*Mean*
		Not implemented	*Implemented*				
			Weak	*Average*	*Good*	*Very good*	
A. Training and Guiding Digital Skills for Managers, Teachers, and Lecturers							
Organizing courses to improve skills in using digital technologies for teaching	n	15	40	81	107	47	2.45
	%	5.17	13.79	27.93	36.9	16.21	
Organizing workshops and training sessions on the application of digital technologies in teaching	n	15	30	89	101	55	2.52
	%	5.17	10.34	30.69	34.83	18.97	
Providing regular support and instructional materials for teachers and lecturers	n	39	60	80	71	40	2.04
	%	13.45	20.69	27.59	24.48	13.79	
Establishing networks to share experiences about digital transformation in education	n	40	20	81	78	71	2.41
	%	13.79	6.90	27.93	26.9	24.48	
B. Training and Guiding Learners to Use Technologies							
Developing programs to guide learners in using digital technologies for learning	n	10	15	73	97	95	2.87
	%	3.45	5.17	25.17	33.45	32.76	
Guiding learners to search for and effectively use digital learning materials	n	15	25	80	100	70	2.64
	%	5.17	8.62	27.59	34.48	24.14	
Organizing practical activities for learners to apply digital technologies in learning	n	20	30	80	110	50	2.48
	%	6.90	10.34	27.59	37.93	17.24	
Guiding learners on information safety and digital ethics in online learning	n	25	35	90	80	60	2.40
	%	8.62	12.07	31.03	27.59	20.69	
C. Developing Digital Competence Through Extracurricular Activities							
Organizing competitions related to digital technology. programming. artificial intelligence. etc.	n	45	40	61	88	56	2.24
	%	15.52	13.79	21.03	30.34	19.31	
Encouraging learners to participate in learning projects applying digital technologies	n	20	25	76	99	70	2.60
	%	6.9	8.62	26.21	34.14	24.14	
Collaborating with enterprises or technology companies to improve learners' digital skills	n	51	35	50	79	75	2.32
	%	17.59	12.07	17.24	27.24	25.86	

Table 4 shows the current status of digital competence training and development in educational and training institutions. Section A provides the current status of training and guiding digital skills for managers, teachers, and lecturers. Organizing courses to improve skills in using digital technologies for teaching had a mean score of 2.45. Most participants rated this activity as good (36.9%) or average (27.93%). Only 5.17% indicated that it was not

implemented. Organizing workshops and training sessions on the application of digital technologies had the highest mean score (M = 2.52). In this area, 34.83% rated the implementation as good and 30.69% as average. A small proportion (5.17%) reported it was not implemented. Providing regular support and instructional materials had the lowest mean score (M = 2.04). About 27.59% assessed it as average, while 24.48% rated it as good, and 13.45% reported it was not implemented. Establishing networks to share experiences about digital transformation showed a mean score of 2.41. In this area, 27.93% reported average implementation, 26.9% rated it as good, and 24.48% as very good.

Section B reports the current status of training and guiding learners to use technologies in educational settings (N = 290). Developing programs to guide learners in using digital technologies for learning had the highest mean score (M = 2.87). In this area, 33.45% of respondents rated the implementation as good and 32.76% as very good. Only 3.45% indicated that this activity was not implemented. Guiding learners to search for and effectively use digital learning materials had a mean of 2.64. Most respondents rated this as good (34.48%) or average (27.59%). Organizing practical activities for learners to apply digital technologies showed a mean score of 2.48, with 37.93% assessing it as good and 27.59% as average. Finally, guiding learners on information safety and digital ethics in online learning had the lowest mean (M = 2.40). In this area, 31.03% reported average implementation and 27.59% rated it as good, while 8.62% indicated it was not implemented.

Section C shows the current status of developing digital competence through extracurricular activities in educational institutions. Organizing competitions related to digital technology, programming, and artificial intelligence had the lowest mean score (M = 2.24). In this area, 30.34% of respondents rated implementation as good, 21.03% as average, and 15.52% reported that it was not implemented. Encouraging learners to participate in learning projects applying digital technologies presented the highest mean (M = 2.60). About 34.14% rated this activity as good, and 24.14% as very good, while only 6.9% indicated it was not implemented. Collaborating with enterprises or technology companies to improve learners' digital skills had a mean score of 2.32. In this area, 27.24% assessed the implementation as good and 25.86% as very good, whereas 17.59% reported it was not implemented.

Table 5. Current Status of Implementing Digital Transformation Tasks in Educational and Training Institutions (N = 290).

Items		*Level*					*Mean*
		Not implemented	*Implemented*				
			Weak	*Average*	*Good*	*Very good*	
Establishing a steering committee for digital transformation	n	10	20	84	101	75	2.73
	%	3.45	6.90	27.59	34.48	27.59	
Developing a digital transformation strategy	n	30	40	103	80	37	2.19
	%	10.34	13.79	35.52	27.59	12.76	
Issuing plans for information technology application and digital transformation	n	20	50	100	78	42	2.25
	%	6.9	17.24	34.48	26.9	14.48	
Issuing regulations on using the digital-based school management system	n	15	30	90	81	74	2.58
	%	5.17	10.34	31.03	27.93	25.52	
Implementing the school management system based on digital transformation	n	40	60	79	68	43	2.05
	%	13.79	20.69	27.24	23.45	14.83	

Table 5 presents the current status of implementing digital transformation tasks in educational and training institutions (N = 290). Establishing a steering committee for digital transformation had the highest mean score (M = 2.73). In this area, 34.48% of respondents rated implementation as good, and 27.59% as very good. Only 3.45% indicated it was not implemented. Developing a digital transformation strategy showed the lowest mean (M = 2.19). About 35.52% rated this activity as average, 27.59% as good, and 12.76% as very good. Issuing plans for information technology application and digital transformation had a mean score of 2.25, with 34.48% assessing it as average and 26.90% as good. Issuing regulations on using the digital-based school management system had a mean of 2.58. In this area, 31.03% rated implementation as average and 27.93% as good. Implementing the school management system based on digital transformation had a mean of 2.05, with 27.24% of respondents selecting average and 23.45% selecting good.

Beyond the descriptive statistics, several key patterns emerged from the data. Notably, educators demonstrated relatively stronger competence in basic technological use and digital teaching tools, while more complex competencies—such as information security, learner guidance, and continuous professional updating—remained underdeveloped. This imbalance suggests that current digital transformation efforts emphasize operational skills rather than holistic digital competence.

4. Discussion

4.1 General Discussion

The findings indicate a noticeable gap between educators' awareness of digital transformation and their ability to apply digital technologies effectively in practice. While conceptual understanding was generally moderate, practical implementation and advanced competencies lagged. This discrepancy highlights that awareness alone is insufficient and must be accompanied by structured training, institutional support, and clear strategic guidance to translate knowledge into effective practice. The present study examined the current awareness, competence, training, and implementation of digital transformation among managers, teachers, and lecturers in educational and training institutions. The findings showed that participants had a moderate understanding of digital transformation concepts, but their awareness of its practical impact and applications was lower. Digital competence was reported at a moderate to good level, especially in using basic technologies and educational software, while skills in information security and learner support were less developed. Training activities to build digital skills for educators and learners were present but limited, with most programs rated at an average or good level, and regular support and guidance remaining insufficient. Efforts to promote digital competence through extracurricular activities and institutional tasks such as forming steering committees and issuing policies were also moderate, with gaps in strategic planning and system implementation. Overall, these results suggest that while initial steps toward digital transformation have been taken, further efforts are needed to strengthen awareness, improve competencies, and enhance the consistency and quality of training and support across educational settings.

The findings indicated that although participants demonstrated a relatively strong understanding of the concept of digital transformation, their awareness of its practical application and impact remained limited. It is essential for educators to comprehend digital transformation in education and training because it fundamentally changes how teaching, learning, and institutional processes are implemented. Digital transformation does not only involve adopting new technologies. It also requires rethinking educational strategies, processes, and roles to prepare students for a technology-driven environment and to help institutions maintain competitiveness and sustainability during rapid change (Fernández et al., 2023; Mohamed Hashim et al., 2021, 2022). Educators who understand this concept can apply emerging tools, such as artificial intelligence, cloud computing, and advanced analytics, to create more personalized and effective learning experiences. These tools also help address issues like the digital divide and information literacy (Mukul & Büyüközkan, 2023; Truong & Diep, 2023; Wang et al., 2024). Awareness of digital transformation supports educators in developing integrated digital strategies instead of isolated efforts, which have been shown to produce stronger long-term outcomes (Fernández et al., 2023; Mohamed Hashim et al., 2021). Moreover, understanding digital transformation enables educators to anticipate and manage challenges, including resistance to change, gaps in digital skills, and the need for sustainable practices (Mohamed Hashim et al., 2022; Shenkoya & Kim, 2023). Educators with knowledge of digital transformation are better prepared to foster innovation, enhance student success, and lead their institutions through ongoing technological and societal changes (Shenkoya & Kim, 2023; Wang et al., 2024).

The findings showed that although participants demonstrated moderate to good competence in basic technology use, their skills in security, learner support, and updating professional knowledge were more limited. Educators' abilities in these areas are equally important as their understanding of digital transformation because they ensure digital tools are applied safely, effectively, and flexibly in educational contexts. Security skills help protect sensitive student information and maintain trust, as digital environments create risks such as data breaches and identity theft. Therefore, strong digital security practices are essential (Guillén-Gámez et al., 2024; Liu & Zhang, 2024). Learner support skills are necessary to meet diverse student needs, promote engagement, and ensure fair access to digital resources, all of which are crucial for successful digital transformation (Falloon, 2020; Zabolotska et al., 2021). The capacity to continuously update knowledge enables educators to follow new technologies and teaching methods, ensuring their practices stay relevant and effective (Saini et al., 2025; Tiwari & Magre, 2025). Without these skills, educators may face challenges in using digital tools responsibly, supporting students properly, or adjusting to constant changes. These limitations can weaken the positive impact of digital transformation in education (Falloon, 2020; Saini et al., 2025). A

comprehensive approach that combines security, learner support, and lifelong learning with digital transformation knowledge helps educators navigate complex digital environments and deliver high-quality, future-oriented education (Falloon, 2020; Tiwari & Magre, 2025; Zabolotska et al., 2021).

The results showed that although some institutions have created committees and regulations to support digital transformation, the development of strategies and the implementation of systems remain at a moderate stage. Strategy development and system implementation are essential in digital transformation for education and training because they provide a clear plan and a structured approach to integrating new technologies and processes. This ensures that changes are purposeful, sustainable, and aligned with institutional objectives (Bisri et al., 2023; Fernández et al., 2023; Mohamed Hashim et al., 2021, 2022). Without a clear strategy, digital initiatives often become fragmented, resulting in limited impact and wasted resources. In contrast, integrated strategies help institutions build competitive advantages and respond to fast-changing educational environments (Fernández et al., 2023; Mohamed Hashim et al., 2021). Systematic implementation ensures that digital transformation is not only about using new tools but also about rethinking organizational structures, processes, and cultures to support long-term innovation and operational effectiveness (Bisri et al., 2023; Mohamed Hashim et al., 2022; Surjawan et al., 2025). Strong strategies also encourage collaboration among stakeholders, promote digital skills and culture, and address challenges related to resource allocation, leadership commitment, and digital equity (Demartini et al., 2020; Surjawan et al., 2025). In addition, continuous monitoring and evaluation of implementation help institutions measure progress, respond to feedback, and improve outcomes for educators and learners (Demartini et al., 2020; Mohamed Hashim et al., 2022). In conclusion, strategy development and system implementation are critical for transforming the potential of digital transformation into real and lasting benefits in education and training (Bisri et al., 2023; Fernández et al., 2023; Mohamed Hashim et al., 2021, 2022).

4.2 Implications

The results of this study have important implications for educational institutions and policymakers in Binh Dinh Province and similar contexts. First, the moderate level of digital awareness among educators suggests that more targeted communication and awareness programs are necessary to improve understanding of digital transformation and its benefits. Second, while educators showed good competence in using basic technologies, their skills in information security, learner support, and continuous learning were more limited. Therefore, professional development should focus not only on technical skills but also on building capacity in these important areas. Third, the findings show that training programs and institutional policies for digital transformation were implemented at a moderate level. To strengthen digital transformation, schools and training centers should develop clear strategies, allocate resources, and monitor progress regularly. Finally, improving collaboration between educational institutions and technology companies may help enhance digital competence among both teachers and learners. These efforts can support the creation of an inclusive and modern learning environment that prepares students for future challenges.

4.3 Limitations and Recommendations

This study has some limitations that should be noted. First, the research used a cross-sectional design, so it only captured data at one point in time and did not assess changes over time. Second, the sample was limited to educators in Binh Dinh Province, which may reduce the generalizability of the results to other regions. Third, the study relied on self-reported data, which could be affected by social desirability bias or inaccurate reporting.

Based on these limitations, future research should consider using longitudinal designs to track the development of digital competence and awareness over time. Researchers could also expand the sample to include educators from different provinces or educational levels to improve the generalizability of findings. Additionally, combining self-reported surveys with objective measures, such as digital skill assessments, may provide a more complete understanding of educators' competencies. Finally, it is recommended that policymakers and school leaders invest in continuous training programs, develop clear digital strategies, and provide regular support to educators to strengthen digital transformation in education.

5. Conclusion

This study assessed the current awareness, digital competence, training practices, and implementation of digital transformation tasks among educators and managers in Binh Dinh Province, Vietnam. The findings showed that participants had a moderate understanding of digital transformation, with stronger competence in basic technology use but lower skills in areas such as information security, learner support, and continuous professional development. Training activities and institutional strategies to promote digital transformation were present but remained at an

average level, with limited consistency and depth. These results highlight the need for more focused efforts to improve educators' digital knowledge and skills. Developing clear strategies, providing regular training, and fostering collaboration with technology partners will help strengthen digital transformation in education. By addressing existing gaps, educational institutions can better prepare teachers and learners to succeed in a rapidly changing digital environment. The study contributes valuable insights for policymakers, school leaders, and training providers to design effective programs that support digital competence and create inclusive and modern educational settings.

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Authors contributions

HLN was responsible for study design and revising. HLN was responsible for data collection. HLN and LTB drafted the manuscript and HTTV and CVT revised it. All authors read and approved of the final manuscript. In this paragraph, it also explains any special agreements concerning authorship, such as if authors contributed equally to the study.

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