

THE CURRENT STATE OF AND SOLUTIONS FOR DEVELOPING SCHOOL GOVERNANCE COMPETENCIES AMONG PRIMARY SCHOOL PRINCIPALS IN HO CHI MINH CITY TO MEET DIGITAL SCHOOL REQUIREMENTS

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ABSTRACT

This study analyzes the current state of school governance competency development among primary school principals in Ho Chi Minh City and proposes a set of solutions to meet the requirements of digital schools. A quantitative survey design and descriptive statistical techniques were employed with 1,136 participants, including 519 teachers, 314 principals, and 303 educational leaders and managers. The survey focused on four dimensions: awareness of competency development, competency development content, development methods, and influencing factors. The findings indicate that participants demonstrated relatively high awareness of the role of digital governance competencies and the need to transform the role of principals, but were more cautious in assessing the suitability of digital schools to actual conditions. The competency development contents received relatively consistent ratings. Self directed learning through digital platforms and professional learning communities were rated more highly than traditional training and professional development approaches, while principals' awareness, management authorities' awareness, and infrastructure conditions were identified as important influencing factors. Based on these findings, the study proposes five groups of solutions organized into a continuous professional development cycle: establishing a competency framework as a reference; providing professional development based on competency gaps; developing competencies through practice and leadership experience; improving assessment and feedback; and building a supportive ecosystem. The findings contribute to shifting the approach to principal development from "participation in professional development courses" to "competency development based on evidence, experience, and continuous feedback."

Keywords:

competency development; school governance; principals; digital schools; professional development.

1. INTRODUCTION

The transition from technology-enabled schools to digital schools introduces new requirements for the development of school principals. The issue is no longer limited to equipping principals with additional knowledge or technological skills. Rather, it concerns their ability to learn, adapt, and restructure management practices in an environment where data, digital platforms, and technological innovation are increasingly integrated into decision-making processes. In this context, principals must perform traditional management functions while developing new competencies, including digital transformation leadership, data utilization, digital process organization, staff development in technology-enabled environments, information security, and change management. Consequently, competency development has become a continuous process rather than a professional development activity with clearly defined starting and ending points. A comprehensive review of school leadership evidence indicates that principal quality is associated with various school outcomes, including instructional practices, working environments, staff collaboration, and professional development (Grissom et al., 2021). The OECD (2016) also highlights the close relationship between school leadership, professional learning communities, and learning environments. Therefore, as the requirements for principals evolve, professional development systems must change accordingly.

In Vietnam, digital transformation in education has been strongly promoted through Decision No. 131/QĐ-TTg on strengthening the application of information technology and digital transformation in education and training for the 2022–2025 period, with an orientation toward 2030. Meanwhile, the Professional Standards for

Principals of General Education Institutions, issued under Circular No. 14/2018/TT-BGDDT, provide an important reference framework for defining principals' professional requirements. More recently, Circular No. 18/2026/TT-BGDDT has further specified the Digital Competency Framework for teachers and educational managers, thereby clarifying the increasingly explicit requirements for management, leadership, and professional development in digital environments. For educational managers, requirements concerning strategic planning, the organization of educational activities in digital environments, the empowerment of teachers and learners, the use of technology and data, professional development, and the application of artificial intelligence indicate that digital competence should not be developed as a separate set of technological skills. Instead, it should be integrated into the performance of school management functions.

However, while standards and competency frameworks specify what principals are expected to achieve, the subsequent management challenge is determining the mechanisms through which these requirements can be translated into practical competencies. This issue is particularly relevant in Ho Chi Minh City, where socioeconomic conditions, the scale of the education system, levels of technology adoption, and digital transformation readiness vary across educational institutions. Under these circumstances, a uniform professional development model with identical content, timelines, and methods for all principals may not adequately address differences in competency gaps and practical working conditions.

Research on leadership development and professional development can be broadly classified into three approaches directly relevant to this issue. The first views competency development primarily through structured preparation and formal training. Effective leadership development programs typically do more than deliver management knowledge. They connect theory with practice through real-world cases, mentoring, field-based experiences, and post-training support (Darling-Hammond et al., 2007). This approach highlights the role of training institutions and professional development programs, while also demonstrating that a standalone course is unlikely to produce sustainable competencies if participants lack opportunities to apply what they have learned.

The second approach emphasizes continuous, work-based professional learning. From this perspective, competencies develop through solving practical problems, reflection, collaboration with colleagues, feedback, and participation in professional learning networks. Active learning, collaboration, professional support, feedback, and sufficient duration are considered important conditions for professional learning to generate changes in practice (Darling-Hammond et al., 2017). This approach is particularly relevant to digital schools because technology evolves rapidly, meaning that knowledge acquired through a formal program can quickly become insufficient. Principals therefore need to participate in professional learning communities, peer networks, and digital learning environments to continuously update their knowledge, experiment with new approaches, and adjust their practices.

The third approach conceptualizes competency development as a human resource management system in which assessment serves not as an endpoint but as an input into the next development cycle. The competency-based approaches of Boyatzis (2008) and Spencer and Spencer (1993) suggest that competencies should be demonstrated through task-related behaviors. Accordingly, development should begin with identifying competency requirements and gaps, providing learning and practice opportunities, assessing subsequent changes, and making further adjustments. The advantage of this approach lies in linking competency standards, learning activities, practical environments, and assessment rather than treating each component as an independent activity.

Although these three approaches provide a substantial foundation, an important gap remains in integrating them into a coherent competency development cycle specifically designed for primary school principals in the context of digital schools. Many professional development activities are still organized according to a program-delivery model in which management authorities or training institutions design the content and principals participate in the programs. This model does not always begin with an individual competency profile, establish a close connection between training and school improvement tasks, or ensure that assessment results are fed back into the adjustment of individual development plans. This gap becomes more pronounced because digital schools require competencies that can only be developed through practice, such as data analysis, system operation, change management, digital risk handling, and leading digital transformation projects.

Unlike studies that focus on describing principals' existing school management competencies, this study takes the competency development process as its unit of analysis. Specifically, it addresses four research questions: (1) How do relevant stakeholders perceive the need to develop school management competencies in the context of digital schools? (2) How are current competency development contents assessed? (3) Which competency development methods receive the most favorable assessments? and (4) Which factors significantly influence the competency development process? Based on the survey findings and theoretical foundations, the study further proposes a cycle-based system of solutions for competency development. Its contribution therefore lies not in redefining the detailed structure of school management competencies, but in clarifying the mechanisms through

which competency standards are translated into learning, learning into practice, and assessment back into further development. Following this introduction, the paper presents the research methodology, analyzes the current situation across four dimensions, develops a set of solutions, and concludes with a discussion of management implications and directions for future research.

2. RESEARCH METHODOLOGY

This study employs a descriptive quantitative survey as its primary research method. This design is appropriate for identifying how different stakeholder groups assess the activities and conditions involved in developing school management competencies, rather than testing a causal model. The unit of analysis is not the existing level of competence in individual management domains, but the system of competency development activities, including awareness, development content, development methods, and influencing factors.

In terms of methodological orientation, the study combines systems and structural approaches, a competency-based approach, a practice-oriented approach, and a continuous professional development approach. The systems and structural approaches are adopted because competency development cannot be reduced to a single training course. Instead, it involves interconnected stages, from defining standards and assessing needs to organizing learning, providing practical opportunities, delivering feedback, and ensuring enabling conditions. The competency-based approach emphasizes the gap between required and existing competencies, thereby treating development needs as specific to each individual. The practice-oriented approach requires development activities to be closely linked to principals' actual management responsibilities and the conditions of individual schools. Finally, the continuous professional development approach regards principals as active participants in professional learning throughout their careers rather than passive recipients of training programs.

The survey sample comprises 1,136 participants, including 519 teachers, 314 principals, and 303 educational leaders and managers in Ho Chi Minh City. These three groups represent different positions within the competency development system. Principals are both the subjects and direct agents of their own professional development. Teachers can observe changes in principals' management behaviors and leadership practices as demonstrated in schools. Educational leaders and managers represent the system-level perspective, encompassing policy requirements, professional development organization, assessment, and the provision of conditions for staff development. Drawing on these three information sources helps reduce exclusive reliance on principals' self-assessments and enables the identification of assessment patterns across different stakeholder perspectives.

The questionnaire focuses on four groups of issues. The first measures awareness of the role of digital management competencies, the need to transform principals' roles, the necessity of competency development, and the suitability of digital schools to local primary education conditions. The second examines competency development content, including the development and application of competency frameworks, professional qualities, management knowledge, management skills, competency-based assessment, and the provision of enabling development conditions. The third examines development methods, such as self-directed learning through digital platforms, professional learning communities, learning from practical models, coaching and mentoring, training at higher education institutions, and continuing professional development. The fourth investigates factors that may influence competency development, including principals' awareness, the awareness of management authorities at different levels, information technology infrastructure, existing qualifications and competencies, management policies and mechanisms, and the digital transformation context.

The items are assessed using a five-point Likert scale, with higher scores indicating more favorable assessments or a greater perceived level of influence. The data are checked, coded, and processed using statistical software. The analysis in this paper focuses on descriptive statistics, particularly mean scores and rankings across the surveyed items. The proposed solutions are developed based on two sources of evidence. The first is the survey findings, which help identify areas requiring improvement in competency development mechanisms. The second is the theoretical literature on competency development, professional learning, and leadership development. The development of solutions follows five principles: goal orientation, systematic integration, effectiveness, practical relevance, and feasibility.

3. RESULTS

This section examines the current state of school management competency development among primary school principals in Ho Chi Minh City based on four dimensions: awareness of competency development, competency development content, competency development methods, and influencing factors. The analysis draws on descriptive statistics, particularly mean scores and the relative rankings of assessment items, to identify existing strengths, limitations, and implications for improving competency development in the context of digital schools.

3.1. Awareness of School Management Competency Development

The findings indicate that the surveyed groups generally demonstrate a relatively clear understanding of the need to develop school management competencies in the digital context. The highest-rated item concerns the role of digital management competencies in school effectiveness, with a mean score of 4.14, followed by the need to transform principals' roles and competencies, with a mean score of 4.08. These findings suggest that digital transformation has become part of educational stakeholders' awareness, not merely as a change in technological tools but also as a requirement for leadership and school management.

However, the assessment of the suitability of digital schools to local primary education conditions received a mean score of only 3.42. This gap indicates that consensus on the objectives of digital transformation does not necessarily imply agreement that all the conditions required for implementation are already in place. In other words, although stakeholders recognize the importance of digital management competencies and the need to transform principals' roles, concerns remain regarding the practical readiness of schools to implement the digital school model. This finding highlights the need to align competency development initiatives with actual school conditions, particularly in terms of infrastructure, professional capacity, and organizational support.

Table 1. Awareness of School Management Competency Development

Item	Teachers	Principals	Educational Managers	Mean	Rank
The role of digital management competencies in school effectiveness	4.20	4.12	4.04	4.14	I
The need to transform principals' roles and competencies in digital environments	4.14	4.06	3.98	4.08	II
The necessity of developing management competencies in the context of digital schools	4.08	4.00	3.92	4.02	III
The suitability of digital schools to local primary education practices	3.48	3.40	3.32	3.42	IV

This finding has direct implications for the design of competency development policies. A professional development program may enhance principals' awareness and knowledge, but if schools lack high-quality data, stable infrastructure, interoperable platforms, or clear mechanisms for data utilization, principals may struggle to translate acquired knowledge into practical competencies. Therefore, competency development should be considered simultaneously at the individual and organizational levels.

3.2. Current State of Competency Development Content

The mean scores for the six competency development items range from 3.59 to 3.63. The small differences indicate that school management competency development cannot be addressed by giving absolute priority to any single content area. From a systems perspective, these six components perform different but closely interconnected functions. The competency framework defines the intended outcomes; professional qualities, knowledge, and skills specify what needs to be developed; assessment identifies competency gaps and progress; and enabling conditions determine whether acquired competencies can be practiced and sustained.

Professional quality development received the highest mean score, although the difference was marginal. In the context of digital schools, professional qualities need to extend beyond traditional requirements such as responsibility, fairness, and dedication to include digital mindsets, digital ethics, data responsibility, innovation, transparency, and lifelong learning. In particular, school leaders must be willing to experiment with new approaches while remaining aware of the ethical and legal limitations of technology.

Management knowledge development achieved a mean score of 3.62. The knowledge required of principals in digital schools is increasingly diverse, ranging from strategic management, human resource management, financial management, and quality management to data governance, information systems, digital security, and artificial intelligence. However, knowledge development creates value only when it is connected to actual management tasks.

Management skills development received a mean score of 3.60, close to that of ensuring enabling conditions for development. These two components are particularly closely related. Skills can only be developed through action, while action depends on the availability of practical conditions. For example, data-driven decision-making skills cannot be sustainably developed if learners are merely introduced to concepts without access to real data, analytical tools, and specific decision-making scenarios.

Table 2. Content of School Management Competency Development

Item	Teachers	Principals	Educational Managers	Mean	Rank
Developing and applying a competency framework	3.67	3.59	3.51	3.61	III
Developing professional qualities	3.69	3.61	3.53	3.63	I
Developing management knowledge	3.68	3.60	3.52	3.62	II
Developing management skills	3.66	3.58	3.50	3.60	IV
Competency-based assessment of principals	3.65	3.57	3.49	3.59	VI
Ensuring conditions for competency development	3.66	3.58	3.50	3.60	IV

Notably, competency-based assessment of principals received the lowest score among the six items, although the difference was small. This finding suggests that the staff development system may not fully utilize the developmental function of assessment. If assessment is primarily intended for end-of-period classification, the resulting information is unlikely to be effectively fed back into subsequent learning activities. Conversely, when assessment is used to identify competency gaps and develop individual development plans, it becomes an integral component of professional learning.

3.3. Methods of School Management Competency Development

Self-directed learning and learning through digital platforms received the highest mean score of 3.85. This finding reflects the demand for a more flexible learning model in which principals can select content, schedules, and learning paces that correspond to their individual competency gaps. This represents a significant advantage over uniform professional development programs. In digital environments, learning systems can integrate learning management systems (LMS), online courses, microlearning, webinars, management case repositories, and AI-powered support tools, thereby making professional learning more continuous.

Professional learning communities (PLCs) ranked second, with a mean score of 3.76. This finding is particularly important for principal development because many management problems do not have a single correct answer that can simply be conveyed through textbooks. Within PLCs, principals can share cases, data, procedures, failures, and implementation experiences. The OECD (2016) highlights the relationship between school leadership, the development of professional learning communities, and school learning environments. Therefore, PLCs should not be regarded solely as a teacher development method but also as an important component of leadership development.

Table 3. Methods of School Management Competency Development

Method	Teachers	Principals	Educational Managers	Mean	Rank
Self-directed learning and learning through digital platforms	3.91	3.83	3.75	3.85	I
Professional learning communities (PLCs)	3.82	3.74	3.66	3.76	II
Visits, learning from, and studying practical models	3.73	3.65	3.57	3.67	III
Coaching and mentoring	3.64	3.56	3.48	3.58	IV
Training at higher education institutions	3.54	3.46	3.38	3.48	V
Continuing professional development	3.54	3.46	3.38	3.48	V

Visits, learning from, and studying practical models ranked third. This method provides principals with opportunities to observe how particular solutions operate under specific conditions, thereby reducing the gap between concepts and action. However, such visits are most effective when participants prepare guiding questions, observe according to defined criteria, analyze the conditions required for transferring practices, and develop post-visit implementation plans. If the activity is limited to observation alone, its contribution to competency development will remain limited.

Coaching and mentoring ranked fourth. This assessment suggests that these methods are not yet the most widely adopted, although they have considerable potential. Their main strength lies in providing personalized support for challenges that principals are directly addressing. A principal implementing a student data system has different needs from one managing staff resistance to digital transformation. Therefore, task-oriented coaching and mentoring can complement the limitations of large-scale, standardized training programs.

Training at higher education institutions and continuing professional development received the same mean score of 3.48. This finding indicates that formal training continues to play an important role in establishing theoretical foundations, systems thinking, and research capabilities. The challenge lies in redesigning programs to integrate academic knowledge, practical cases, improvement projects, mentoring, and post-training follow-up. Darling-Hammond et al. (2007) show that high-quality leadership development programs typically establish strong connections between training content and practical experience rather than treating these as separate processes.

3.4. Factors Influencing School Management Competency Development

Principals' awareness was rated by the surveyed groups as the most influential factor, with a mean score of 4.14. This can be explained by the principal's role as an active agent in professional learning. If principals regard competency development as an administrative requirement, learning activities may be limited to obtaining certificates or attending courses. Conversely, when competency development is viewed as essential to effective leadership, principals are more likely to identify their own competency gaps, seek learning resources, experiment with new approaches, and reflect on their practices.

Awareness among management authorities ranked second, with a mean score of 4.07. This finding suggests that competency development should not be regarded solely as the responsibility of individual principals. Management authorities determine several important conditions: which standards are applied, how development needs are identified, who participates in which programs, whether learning outcomes inform personnel planning and assessment, and whether schools are given the space to experiment with innovations. Competency development is therefore both an individual self-development process and a human resource management function within the education system.

Information technology infrastructure ranked third, with a mean score of 3.97. In other fields, learners may be able to practice certain skills even under resource constraints. However, in digital school management, the technological environment is itself part of the practical learning context. Without reasonably standardized data, principals may struggle to learn data analysis. Without stable management systems, platform operation skills are difficult to develop. Without clear access control and security mechanisms, learning about data governance may remain theoretical. Infrastructure therefore serves both as an operational condition for digital schools and as an environment for professional learning.

Principals' existing qualifications and competencies ranked fourth. This indicates that development needs are differentiated. Principals with strong data-related foundations may require advanced content on AI or change leadership, whereas those with lower levels of digital readiness may need to strengthen foundational knowledge and skills. This provides an important rationale for moving from uniform training to competency-gap-based development.

Management policies and mechanisms ranked fifth, while the broader digital transformation and Fourth Industrial Revolution context ranked sixth. This ordering suggests that participants perceive factors closely related to practical activities as more influential than broader contextual conditions. Technology creates pressure for change, but this pressure translates into competency development only when it is converted into concrete standards, policies, resources, learning opportunities, and feedback mechanisms.

Table 4. Factors Influencing School Management Competency Development

Factor	Teachers	Principals	Educational Managers	Mean	Rank
Principals' awareness	4.20	4.12	4.04	4.14	I
Awareness of management authorities at different levels	4.13	4.05	3.97	4.07	II
Physical facilities and information technology infrastructure	4.03	3.95	3.87	3.97	III
Principals' qualifications and competencies	3.96	3.88	3.80	3.90	IV
Management orientations, policies, and mechanisms	3.87	3.79	3.71	3.81	V
Digital transformation and the Fourth Industrial Revolution context	3.78	3.70	3.62	3.72	VI

3.5. A System of Solutions for Developing School Management Competencies to Meet the Requirements of Digital Schools

Based on the survey findings and theoretical perspectives on competency development, professional learning, and leadership development, five groups of solutions are proposed. These solutions are designed to be interconnected and mutually supportive, forming a process that progresses from defining competency requirements and organizing professional development to developing competencies through practice, assessment and feedback, and ensuring appropriate support conditions.

3.5.1. Developing a Digital School Management Competency Framework for Primary School Principals in Ho Chi Minh City by Integrating the Principal Standards and the Digital Competency Framework of the Ministry of Education and Training

The competency framework provides the basis for defining the requirements that primary school principals need to meet when managing schools in digital environments. Its development should build on the Professional Standards for Principals of General Education Institutions while integrating digital competency requirements for educational managers. Accordingly, digital competence should not be regarded as a separate set of technological skills but should be demonstrated through principals' performance of management functions, including planning, instructional management, staff development, administrative organization, financial management, facilities management, educational quality assurance, and digital environment management.

The framework should be translated into observable, assessable, and developable criteria and behavioral indicators, thereby establishing a consistent reference system for principal development. Based on this framework, each principal can identify competencies that have been adequately developed, areas requiring improvement, and priorities for further development. Assessment results should be translated into individual competency profiles and development plans specifying objectives, content, methods, implementation timelines, and evidence of achievement. Under this approach, the competency framework serves not merely as an assessment instrument but, more importantly, as a guide for each principal's professional development. This helps address the limitations of uniform training programs that do not sufficiently account for individual needs and competency gaps.

3.5.2. Organizing Professional Development to Enhance Digital School Management Competencies among Primary School Principals in Ho Chi Minh City Based on the Competency Framework

Professional development activities should be organized according to the needs and competency gaps identified through the framework rather than applying the same program to all principals. The content can be structured into flexible modules linked to specific management responsibilities in digital environments, including educational data management and utilization; data-informed planning and decision-making; the application of artificial intelligence in management; change leadership; digital safety, ethics, and data privacy; instructional management in digital environments; the development of staff digital competencies; technology investment management; and data-driven quality management. The selection of content and level of participation should reflect each principal's development needs and the actual conditions of their school.

Professional development methods should also be diversified by combining self-directed learning through digital platforms with training sessions, thematic seminars, case studies, professional learning communities, and expert support. For foundational topics, digital resources and short learning modules can enable principals to manage their learning schedules and pace independently. For complex competencies, such as change leadership, data governance, and addressing challenges arising during digital transformation, greater emphasis should be placed on real-world cases, discussion, and problem-solving activities.

Professional development outcomes should not be measured solely by participation hours or knowledge test scores. Instead, they should be demonstrated through tangible outputs that can be applied to school management. These may include digital transformation plans, proposals for using data in decision-making, data governance procedures, staff development plans, or specific school improvement projects. This approach directly connects professional development with workplace practice and makes it an integral component of competency development.

3.5.3. Developing School Management Competencies among Primary School Principals in Ho Chi Minh City through Practical Activities and Leadership Experiences in the Context of Digital Transformation

Management competencies can only be fully developed when knowledge is applied to solving actual school tasks and problems. Therefore, alongside formal professional development, principals should be provided with opportunities to develop their competencies through practical application, leadership experiences, problem-solving, and reflection on their own management practices. Each principal may select, or be assigned, an improvement task that aligns with the school's needs. Examples include using data for planning and decision-making, improving administrative procedures in digital environments, applying technology to instructional management, developing teachers' digital competencies, or piloting artificial intelligence applications in appropriate management activities.

Professional learning communities for principals should be established across school clusters, geographical areas, or the city's digital platforms. Their activities should focus on practical challenges faced by principals rather than being limited to theoretical discussions. Principals can share specific management problems, relevant data, implemented solutions, and emerging difficulties, enabling members to analyze issues collectively, exchange experiences, and propose appropriate responses. This process supports practical problem-solving while facilitating the development of shared knowledge and resources across schools.

In addition to peer learning, personalized consultation, coaching, and mentoring should be strengthened. Support providers may include experienced principals, educational managers, university lecturers, or specialists with relevant expertise. These activities should be directly connected to the tasks principals are undertaking, helping them analyze problems, consider alternative approaches, receive feedback, and draw lessons from experience. In this way, competency development takes place within everyday work and contributes to principals' capacity for self-directed learning, self-adjustment, and problem-solving.

3.5.4. Assessing Primary School Principals in Ho Chi Minh City against the Digital School Management Competency Framework

Principal assessment should not serve solely as a basis for performance classification but should also provide information to support professional development. Assessment results should help principals identify the extent to which they meet competency requirements, areas where progress has been achieved, and competencies requiring further development. Assessment should therefore be closely aligned with the competency framework and regarded as an integral stage of the overall principal development process.

To provide a more comprehensive picture of practical competencies, multiple sources of information should be combined, including principals' self-assessments, assessments by educational managers, teacher feedback, and evidence from actual management activities. In particular, competencies related to digital schools should be assessed through observable behaviors and practical outputs rather than general perceptions alone. For example, principals' data utilization competencies can be evaluated by examining how they use data to develop plans, monitor activities, make decisions, and justify management decisions.

Assessment results should be accompanied by specific feedback and incorporated into each principal's competency profile. On this basis, individual development plans can be adjusted, and subsequent training content or practical assignments can be identified more appropriately. Assessment thus becomes not an endpoint but the foundation for a new development cycle. This process can follow a planning, implementation, assessment, and adjustment logic, enabling professional development to shift from isolated training sessions to a continuous, feedback-driven, and self-adjusting process.

3.5.5. Establishing the Conditions Necessary for Developing School Management Competencies among Primary School Principals in Ho Chi Minh City to Meet the Requirements of Digital Schools

The effectiveness of the proposed solutions depends substantially on organizational conditions and the availability of a supportive environment. It is therefore necessary to establish a professional development ecosystem in which policies, infrastructure, resources, organizational culture, and coordination among stakeholders collectively enable principals to learn, practice, and develop their competencies continuously.

First, stronger links should be established between competency assessment, training, professional development, personnel planning, and staff development. Assessment results should serve as a basis for identifying development needs and determining appropriate content rather than remaining an isolated performance classification activity. At the same time, adequate digital infrastructure and platforms should be provided so that principals can perform their management responsibilities while accessing learning opportunities and sharing experiences in digital environments. Supporting resources may include online learning platforms, repositories of management resources and cases, competency profiles, data analysis support tools, professional exchange spaces, and artificial intelligence tools used appropriately in accordance with management requirements and data security standards.

Financial resources should also be allocated on a stable and long-term basis. Competency development funding should not be limited to training courses but should also support consultation, coaching, resource development, platform operation, the implementation of initiatives, and the dissemination of effective management models. In addition, a culture of learning and innovation should be fostered among educational managers, encouraging principals to experiment with appropriate approaches and learn from data and practical experience while maintaining accountability, professional ethics, and safety throughout the innovation process.

Furthermore, coordination should be strengthened among educational management authorities, primary schools, higher education institutions, research institutes, experts, and technology solution providers. Educational management authorities should provide strategic direction and enabling conditions; schools should serve as environments for practical application and competency development; training and research institutions and experts should provide professional support; and technology providers should offer technical solutions suited to educational needs. Such collaboration can create a continuous professional development environment while ensuring that competency development solutions remain aligned with the practical requirements of primary schools throughout the digital transformation process.

4. CONCLUSION AND DISCUSSION

The study shows that developing school management competencies among principals in the context of digital schools should be implemented as a continuous and systematic process rather than through isolated professional development courses. The survey results indicate that all participant groups had a relatively clear understanding of the role of digital management competencies and the need to transform principals' roles. However, the more cautious assessments of the suitability of digital schools to actual conditions reveal a gap between the requirements and the capacity to implement them in schools. Therefore, principal competency development is not merely an individual matter but also depends on the working environment, implementation conditions, and support from management authorities at different levels.

The survey findings on competency development content also show that competency frameworks, professional qualities, knowledge, skills, assessment, and enabling conditions received relatively similar levels of attention. This suggests that principal competency development requires an integrated combination of activities. Knowledge-based training is unlikely to bring about changes in practice if principals lack opportunities to apply what they have learned to their work. Similarly, a competency framework is meaningful only when it serves as a basis for assessment, needs identification, and the organization of professional development. Assessment should also be accompanied by feedback and development guidance so that principals can identify their strengths, areas for improvement, and competencies requiring further development.

One notable finding is that self-directed learning through digital platforms, professional learning communities, and practice-based learning were rated more positively than some traditional professional development methods. This does not diminish the role of higher education institutions or continuing professional development programs; rather, it highlights the need to renew the way professional development activities for principals are organized. Such programs should strengthen the integration of theoretical knowledge with case-based problem-solving, practical assignments, digital learning, professional exchange, and support from experienced practitioners. This approach is consistent with the view that effective leadership development programs should provide opportunities for learners to connect knowledge with practice and receive support throughout their professional development (Darling-Hammond et al., 2007).

The findings on influencing factors further highlight the importance of human factors in the digital transformation process. Principals' awareness and that of management authorities were rated as significant influencing factors, alongside infrastructure and organizational conditions. This indicates that technology creates opportunities for innovation, but the effectiveness of transformation depends largely on how principals identify problems, mobilize staff, use data, and organize change. At the same time, digital infrastructure remains essential, as principals will find it difficult to develop and sustain management competencies in digital environments without appropriate technological and data foundations and opportunities for practical application.

Based on the research findings, the development of digital school management competencies can be guided by three closely interrelated principles. First, development activities should be based on the gap between required competencies and each principal's current level of competence. Second, knowledge and skills should be reinforced through task performance, practical experience, professional exchange, and reflection on practice. Finally, assessment and feedback should be conducted regularly to identify progress and adjust development plans. Combining these three principles helps shift professional development from a primary focus on knowledge provision toward supporting principals in acquiring and strengthening practical competencies.

From a management perspective, the five proposed groups of solutions should be implemented in an integrated manner rather than treated as five separate programs. The competency framework first provides a common reference for defining requirements and identifying each principal's competency gaps. On this basis, professional development content can be selected according to individual needs. Practical activities create opportunities to apply and reinforce competencies, while assessment and feedback help determine progress and adjust development plans. The entire process requires support through appropriate policies, infrastructure, resources, and a professional learning environment. This approach can make principal competency development a continuous process closely linked to daily work and the actual needs of each school.

The study contributes to clarifying how the competency development process for school principals can be organized in the context of digital schools. Rather than focusing solely on determining principals' current competency levels, the study addresses the subsequent question of how these competencies should be developed. Drawing on the survey findings, it connects the competency framework, professional development, practice-based learning, assessment, and enabling conditions into a continuous development process. This approach also demonstrates that competency development is not the sole responsibility of principals themselves but requires support from schools, management authorities, and other relevant stakeholders.

The study has several limitations. The data primarily reflect the perceptions of survey participants and were analyzed using descriptive statistics. Therefore, they do not allow causal relationships to be established between influencing factors and competency development outcomes. Future studies could validate the measurement scale, analyze differences among respondent groups, and examine factors that may predict principal competency development. Longitudinal research should also be considered to assess changes in competencies throughout the professional development process. In addition, the relevance and effectiveness of the proposed solutions should be further examined through expert consultation, pilot implementation, and evaluation in practice before they are applied on a broader scale.

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