



Developing a Digital Leadership Model for Malaysian School Leaders: A Needs Analysis

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ABSTRACT

The rapid advancement of technology has become a central topic of discussion, both globally and locally, significantly impacting various sectors, including communication, economics, healthcare, and, notably, education. Consequently, school leaders are increasingly required to be well-prepared and thoroughly equipped with necessary digital knowledge and expertise to navigate this advancement effectively. The adaptation of leadership styles to align with technological advancements is crucial for school leaders to remain effective in their roles. This study aimed to investigate the critical need for developing a digital leadership model tailored for school leaders in Malaysia. To achieve this objective, a qualitative research approach, particularly semi-structured interviews, was employed on study participants, who were experienced school leaders from various regions in Malaysia, to obtain rich, in-depth data. Thematic analysis was then applied to the collected data, with codes systematically assigned to identify and extract key themes and findings. The research identified three core themes: (i) competence in technology-related theories, (ii) a guideline for school leadership, and (iii) a guideline as a future reference for leaders. The study findings indicate a strong necessity for the development of a digital leadership framework, alongside important perspectives for educational stakeholders, thereby making a substantial contribution to the current body of literature on digital leadership within the Malaysian educational context.

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1. INTRODUCTION

In the age of globalisation, digital technology has increasingly shaped sectors such as medicine, economics, science, education, agriculture, sports, construction, and organisational management. Since the early 2000s, rapid technological advancement has accelerated the need for institutions to adapt to digital change. Collin et al.¹ observed that organisational management is increasingly influenced by digital transformation, indicating that leadership practices must evolve in response to technological change. In education, this transformation has created new expectations for school leaders, who are required not only to manage administrative responsibilities but also to lead digital innovation, support technology integration, and prepare schools for increasingly complex learning environments.

Historically, computers were initially used for routine tasks such as typing, storing documents, and executing basic applications. However, the development of internet-based systems has made information and communication technology (ICT) central to contemporary educational management.² In schools, leaders play a decisive role in ensuring that ICT is implemented effectively and aligned with institutional goals. Their ability to act promptly, make informed decisions, and support teachers in using technology strengthens their role as technology leaders.³ Therefore, school leaders require more than basic ICT skills; they need digital leadership competencies that enable them to integrate technology strategically, respond to changing educational demands, and lead sustainable digital transformation in their schools.⁴ In a digitally proficient school culture, school leaders must be equipped not only to use technology but also to guide its meaningful integration into the curriculum, administration, and school improvement.

Although digital transformation offers significant opportunities to improve school administration and educational practices, its implementation remains complex and challenging.⁵ In the Malaysian school context, digital leadership is influenced not only by technological readiness but also by school culture, teacher confidence, infrastructure availability, community expectations, and differences between school locations. These socio-cultural and institutional factors may affect how school leaders interpret, adopt, and sustain digital initiatives. Meanwhile, their competencies, supports, and contextual conditions required can be identified through a needs analysis. Accordingly, the development of a digital leadership model could help school leaders adapt to technological change, strengthen administrative effectiveness, support teachers, and promote more sustainable digital transformation in education. However, existing standards and initiatives do not yet provide a context-

¹ Jari Collin, Kari Hiekkanen, Janne J. Korhonen, Marco Halen, Timo Itälä, and Mika Helenius, *IT Leadership in Transition: The Impact of Digitalization on Finnish Organizations*, Aalto University Publication Series Science + Technology 7/2015 (Helsinki: Aalto University, 2015).

² Mohd Norakmar Omar, Siti Noor Ismail, and Abd Latif Kasim, "Karakter Kepimpinan Teknologi Pengetua dalam Pengintegrasian ICT di Sekolah Menengah," *Jurnal Kepimpinan Pendidikan* 7, no. 1 (2020): 28-46.

³ Ndidi Loretta Okeke and H. I. Dike, "Head Teachers' Technology Leadership Competencies and ICT Integration in Model Primary Schools in Rivers State," *International Journal of Innovative Information Systems & Technology Research* 7, no. 1 (2019): 14-21.

⁴ Françoise Contreras, Elif Baykal, and Ghulam Abid, "E-Leadership and Teleworking in Times of COVID-19 and Beyond: What We Know and Where Do We Go," *Frontiers in Psychology* 11 (2020): 590271.

⁵ Michael Wade and Jialu Shan, "Covid-19 Has Accelerated Digital Transformation, but May Have Made It Harder Not Easier," *MIS Quarterly Executive* 19, no. 3 (2020): Article 7.

specific digital leadership model grounded in the reported needs and constraints of Malaysian school leaders.

Digital leadership has emerged as a progressively important subject in contemporary schooling. In his book *Digital Leadership: Changing Paradigms for Changing Times*, Sheninger⁶ defines digital leadership as the utilisation of technology to foster a constructive school culture and improve the educational process. Proficient leaders utilise technology not merely for operational purposes but also to equip educators and learners with the tools they need to achieve their educational objectives. This perspective positions digital leadership as a broader leadership practice that involves using technology strategically to support teaching, learning, and organisational development. In the Malaysian educational context, Mat Rahimi et al.⁷ examined the pivotal role of school leaders in facilitating digital transformation within Malaysian educational institutions in their article, 'Digital Leadership Among School Leaders in Malaysia'. They asserted that leaders must possess a definitive vision for how technology may enhance educational processes and should endeavour to establish an ecosystem that facilitates the integration of technology in schools. Digital leadership consequently requires school leaders to provide direction for technological integration while creating the conditions necessary for teachers and other members of the school community to adopt and utilise digital technologies effectively.

The role of digital leaders also involves responding effectively to continuous technological change. The research conducted by Vijayakumar et al.⁸ underscored the necessity for global educational leaders to adapt to rapid technological advancements. Successful leaders in the digital world are those who adeptly handle change with flexibility and innovation. The study emphasised the necessity for leaders to provide adequate support to help teachers and students adapt to new technologies within the educational framework. More recently, the increasing availability of artificial intelligence (AI) and other digital tools has further expanded the strategic dimensions of digital leadership. Quaquebeke and Gerpott⁹ examined how technology like artificial intelligence (AI) can revolutionise decision-making and organisational management for leaders. Artificial intelligence and other digital tools enable leaders to manage day-to-day responsibilities, allowing them to focus on the strategic and innovative dimensions of leadership.

Educational leadership must adapt to technological transformations to ensure the efficacy and sustainability of instructional methods in the rapidly advancing digital age. In Malaysia, the Ministry of Education Malaysia (KPM) implemented initiatives such as 1BestariNet and the Digital Education Policy (DPD) to promote the integration of digital technology in education.¹⁰ However, a substantial gap persists in their implementation at the school level. Many school leaders lack the knowledge and skills necessary to integrate digital technology into administration and education.¹¹ This deficit

⁶ Eric C. Sheninger, *Digital Leadership: Changing Paradigms for Changing Times* (Corwin Press, 2019).

⁷ Mat Rahimi Yusof, Mohd Faiz Mohd Yaakob, and Mohd Yusri Ibrahim, "Digital Leadership Among School Leaders in Malaysia," *International Journal of Innovative Technology and Exploring Engineering* 8, no. 9 (2019): 1481-1485, <https://doi.org/10.35940/ijitee.I8221.078919>.

⁸ P. B. Vijayakumar, Michael J. Morley, Noreen Heraty, Mark E. Mendenhall, and Joyce S. Osland, "Leadership in the Global Context: Bibliometric and Thematic Patterns of an Evolving Field," in *Advances in Global Leadership* (Emerald Publishing Limited, 2018), 31-72.

⁹ N. Van Quaquebeke and F. H. Gerpott, "The Now, New, and Next of Digital Leadership: How Artificial Intelligence (AI) Will Take Over and Change Leadership as We Know It," *Journal of Leadership & Organizational Studies* 30, no. 3 (2023): 265-275, <https://doi.org/10.1177/15480518231181731>.

¹⁰ Kementerian Pendidikan Malaysia, *Pelan Pembangunan Pendidikan Malaysia 2013-2025* (Putrajaya: Kementerian Pendidikan Malaysia, 2013), <https://www.moe.gov.my/menumedia/media-cetak/penerbitan/1813-pppm-2013-2025/file>.

¹¹ Mohd Norakmar Omar, Ismail, and Kasim, "Karakter Kepimpinan Teknologi Pengetua."

adversely impacts educational quality and hinders students from fully leveraging technology in their learning experiences.

Several factors contribute to this implementation gap. School leaders frequently encounter obstacles such as limited ICT infrastructure, insufficient technical support, and a lack of appropriate training.¹² These challenges lead to disparities in technology utilisation across schools, hindering initiatives to improve the overall quality of education. A digital competency assessment conducted by the Ministry of Education Malaysia in 2021 involving 36,341 school leaders found that 19,209 (52.9%) were at the Basic level, compared with 16,392 (45.1%) at the Intermediate level and 740 (2.0%) at the Advanced level.¹³ Therefore, the challenge extends beyond the availability of digital technologies to the capacity of school leaders to manage and integrate these technologies effectively. The growing complexity of digital transformation has also created new demands for school leadership. Gfrerer et al.¹⁴ note that research on digital leadership remains nascent, lacking in-depth analysis of its characteristics. Nurul Salwani Abdullah and Suhaida Abdul Kadir¹⁵ observed that school leaders encounter unprecedented challenges in responding to growing digital technologies while concurrently equipping instructors for a digital landscape. These developments necessitate that contemporary school leaders be better equipped to navigate the ongoing digital transition.

Therefore, digital leadership requires more than basic technological proficiency. Mat Rahimi et al.¹⁶ believe that digital leadership encompasses several tiers prior to an individual being recognised as a digital leader. It involves proficiency in operating devices and in disseminating components of ICT. Similarly, Adhi Masri Yeop Johari et al.¹⁷ assert that, due to the ongoing transformations in the technological world, a school leader must adeptly utilise and manage diverse resources associated with accessible technology. Accordingly, this study aimed to investigate the prerequisites for developing a digital leadership model that enables school leaders to effectively cultivate and influence future digital leaders. This gap indicates the need for a needs analysis that identifies the competencies, guidance, and contextual support required before a Malaysian digital leadership model is developed.

The adoption of technological innovations is common in the field of education. In Malaysia, computers were first introduced in the late 1980s. Following the inauguration of the Multimedia Super Corridor (MSC) in 1996, KPM, as part of the government's strategy to elevate Malaysia to a developed nation, initiated the creation of 88 smart schools in 1999. In 2013, KPM initiated proactive efforts by executing the 1BestariNet initiative and VLE Frog across all Malaysian schools. This initiative provided high-speed 4G internet access that improved internet infrastructure in 10,000 primary and secondary schools in Malaysia and a virtual learning platform that enabled rapid connectivity and access to Integrated Learning Solutions.¹⁸ In 2019, KPM developed the ICT Change Plan 2019–2023, intending to

¹² Kementerian Pendidikan Malaysia, *Pelan Pembangunan Pendidikan Malaysia 2013-2025*.

¹³ Kementerian Pendidikan Malaysia, *Dasar Pendidikan Digital* (Kuala Lumpur: Kementerian Pendidikan Malaysia, 2023), 19.

¹⁴ Angelika E. Gfrerer, Lisa Rademacher, and Sandra Dobler, "Digital Needs Diversity: Innovation and Digital Leadership from a Female Managers' Perspective," in *Digitalization: Approaches, Case Studies, and Tools for Strategy, Transformation and Implementation* (Springer, 2021), 335-349.

¹⁵ Nurul Salwani Abdullah and Suhaida Abdul Kadir, "Relationship Between Principals' Digital Leadership and Teachers' Digital Competency in Klang District Secondary Schools," *Asian Journal of Vocational Education and Humanities* 4, no. 2 (2023): 1-14.

¹⁶ Mat Rahimi Yusof, Mohd Yaakob, and Ibrahim, "Digital Leadership Among School Leaders in Malaysia."

¹⁷ Adhi Masri Yeop Johari, Muhammad Faizal A. Ghani, Norfariza Mohd Radzi, Amalina Ayub, and Maszuria A. Ghani, "Challenges of School Leaders' Digital Leadership: An Initial Study in Bintulu, Sarawak, Malaysia," *Jurnal Akuntabilitas Manajemen Pendidikan* 11, no. 1 (2023), <https://doi.org/10.21831/jamp.v11i1.58443>.

¹⁸ Kementerian Pendidikan Malaysia, *Pelan Pembangunan Pendidikan Malaysia 2013-2025*.

integrate the Digital Educational Learning Initiative Malaysia (DELIMa) learning platform as part of educational reform. In 2023, KPM's DPD signified its commitment to revolutionising the digital education framework, aiming to develop a digitally adept and competitive generation by enhancing the knowledge, skills, and values of students, educators, and educational leaders. However, the progression of national digital education initiatives also indicates that policy development alone is insufficient without leadership capacity at the school level. Therefore, school leaders must be prepared to translate these policy directions into practical digital practices that respond to the needs and constraints of their respective schools.

In Western contexts, digital leadership standards have been developed to guide school leaders in responding to technological change. For example, the International Society for Technology in Education (ISTE) identifies five major characteristics of digital leadership: (i) visionary leadership, (ii) a culture of digital-age learning, (iii) excellence in professional practice, (iv) systemic improvement, and (v) digital citizenship. These characteristics provide a useful benchmark for understanding how school leaders can create digital learning cultures and support technology-based school improvement. However, international standards cannot be adopted without considering the local educational context, because the readiness of school infrastructure, teachers, students, and communities may differ across countries and school systems. In the Malaysian context, Institut Aminuddin Baki (IAB) plays an important role in strengthening educational leadership and management among school leaders under the Ministry of Education Malaysia. IAB developed the Standard Competency of Malaysian School Leaders 2.0 (KOMPAS 2.0) in 2020 as a guide and reference for improving leadership quality in educational institutions. KOMPAS 2.0 consists of five areas and eighteen competencies that support school leadership. Although KOMPAS 2.0 provides a strong foundation for leadership development, its application to digital leadership requires further clarification, particularly in relation to how school leaders create digital ecosystems, manage educational data, mobilise teachers, and respond to the challenges of digital transformation.

This study employed two domains and three competencies from the KOMPAS 2.0 model. The educational domain focused on the ability to create a digital ecosystem, whereas the operational domain emphasised the management of educational data and resources. The ISTE framework was also used as a reference to interpret the characteristics of digital leadership among school leaders. By integrating KOMPAS 2.0 and ISTE, this study positioned digital leadership as both a local leadership requirement and a global educational leadership practice. Nevertheless, the development of a digital leadership model for Malaysian school leaders must go beyond adapting existing frameworks; it must also examine the actual needs, challenges, and leadership practices experienced by school leaders in Malaysian schools. Thus, ISTE identifies broad digital leadership expectations, while KOMPAS 2.0 anchors them in national leadership competencies; neither framework alone explains how these expectations should be enacted across Malaysian schools with different levels of readiness.

The concept of 'leadership' has been interpreted diversely by scholars. For example, Kouzes¹⁹ defines leadership in terms of the elements involved in attaining it. Kouzes²⁰ asserts that leadership is characterised by providing direction, articulating a vision, confronting challenges, offering support for action, and self-motivation. Meanwhile, Robbins and Judge²¹ define leadership as the ability to

¹⁹ James M. Kouzes and Barry Z. Posner, *The Leadership Challenge* (San Francisco, CA: Jossey-Bass, 2007).

²⁰ Kouzes and Posner, *The Leadership Challenge*.

²¹ Stephen P. Robbins and Timothy A. Judge, *Organizational Behavior* (Pearson South Africa, 2009).

influence a group of people in pursuit of specific objectives. On the other hand, Ivancevich et al.²² define leadership as the process of influencing individuals to promote the attainment of pertinent organisational objectives. Thus, this study defines leadership as the ability to influence others, offer support, and articulate a clear vision to achieve goals.

In today's digital age, digital leadership is a vital skill for leaders because it requires strong digital knowledge and the ability to lead technology-based transformation.²³ Sagbas and Erdogan²⁴ explain that digital leadership should facilitate digital transformation within organisations by improving the work environment and strengthening the learning culture through digitisation. Zhong²⁵ further explains that digital leadership involves inspiring digital transformation, developing a digital learning environment, supporting professional growth through technology, and building a digital organisation. These perspectives suggest that digital leadership is not limited to the use of technological tools; rather, it involves strategic decision-making, teacher support, organisational readiness, and the creation of a sustainable digital culture. However, empirical studies that examine how digital leadership competencies are translated into school-level practice, particularly in the Malaysian context, remain limited. This gap justifies conducting a needs analysis to identify the competencies and contextual requirements for developing a digital leadership model for Malaysian school leaders.

2. METHODS

This study aimed to identify the needs and essential components for developing a digital leadership model informed by the experiences of Malaysian school leaders. A qualitative approach was employed because the study sought to explore participants' perceptions, experiences, and contextual understanding of digital leadership in schools. Semi-structured interviews were selected as the main method of data collection because they allowed participants to explain their views in depth while enabling the researchers to probe issues related to digital competency, leadership practices, implementation challenges, and the need for a structured digital leadership model. This study employed a qualitative case study design involving five school leaders in Malaysian schools. A case study approach was considered appropriate because the study focused on exploring a specific phenomenon, namely the needs and prerequisites for developing a digital leadership model for school leaders. Quintão et al.²⁶ assert that case studies are commonly used in qualitative research to examine a particular unit, case, or phenomenon in depth. Bogdan and Biklen²⁷ and Merriam and Tisdell²⁸ further explain that case study research enables researchers to generate rich and contextualised understanding

²² John M. Ivancevich, Robert Konopaske, and Michael T. Matteson, "Introduction to Organizational Behavior," in *Organizational Behavior and Management*, 7th ed. (Tata McGraw-Hill, 2005), 19-20.

²³ Giovanni Schiuma, E. Schettini, F. Santarsiero, and D. Carlucci, "The Transformative Leadership Compass: Six Competencies for Digital Transformation Entrepreneurship," *International Journal of Entrepreneurial Behavior & Research* (2021), <https://doi.org/10.1108/IJEBR-01-2021-0087>.

²⁴ Murat Sagbas and F. A. Erdogan, "Digital Leadership: A Systematic Conceptual Literature Review," *İstanbul Kent Üniversitesi İnsan ve Toplum Bilimleri Dergisi* 3, no. 1 (2022): 17-35.

²⁵ L. Zhong, "Indicators of Digital Leadership in the Context of K-12 Education," *Journal of Educational Technology Development and Exchange (JETDE)* 10, no. 1 (2017): 3, <https://doi.org/10.18785/jetde.1001.03>.

²⁶ C. Quintão, P. Andrade, and F. Almeida, "How to Improve the Validity and Reliability of a Case Study Approach?," *Journal of Interdisciplinary Studies in Education* 9, no. 2 (2020): 264-275.

²⁷ Robert Bogdan and Sari Knopp Biklen, *Qualitative Research: An Introduction to Theories and Methods* (Boston, MA: Allyn and Bacon, 2007).

²⁸ Sharan B. Merriam and Elizabeth J. Tisdell, *Qualitative Research: A Guide to Design and Implementation* (John Wiley & Sons, 2015).

of participants' experiences. According to Yin²⁹, case studies serve investigative and descriptive purposes, making them suitable for examining how school leaders understand digital leadership and what competencies are required to support its implementation in Malaysian schools.

The study was guided by the main research question: What are the prerequisites for developing a digital leadership model in Malaysian schools? Data were collected through semi-structured interviews, which enabled participants to describe their leadership experiences and explain the challenges associated with digital transformation in schools. Each interview lasted approximately 45 minutes, was audio-recorded, transcribed verbatim, and coded for thematic analysis. To enhance the validity and reliability of the qualitative data, Bogdan and Biklen³⁰ emphasise the importance of verifying interview data with participants. Accordingly, the interview transcripts were returned to participants for review and confirmation. This process functioned as member checking and helped ensure that the participants' views were accurately represented before the data were analysed. The participants were selected using purposive sampling. Purposive sampling refers to the intentional selection of individuals who are able to provide rich and relevant information about the phenomenon under investigation.³¹ In this study, five participants were selected based on three criteria: (i) they were school leaders in Malaysian schools, (ii) they had at least five years of leadership experience, and (iii) they had experience or involvement related to digital practices, ICT use, or school-level digital initiatives. These criteria ensured that the selected participants could provide informed perspectives on the competencies and contextual needs required to develop a digital leadership model. The sample was intended to obtain context-rich perspectives for this exploratory needs analysis rather than to represent all Malaysian school leaders statistically.

A semi-structured interview protocol was used as the main research instrument because it provides flexibility for participants to share their experiences while allowing the researcher to maintain focus on the research objectives.³² The interview protocol was developed based on the study's focus on digital leadership competencies, school-level digital practices, implementation challenges, and the need for a digital leadership guideline. The interview questions were designed to elicit participants' views on the knowledge, skills, support systems, and contextual factors required by school leaders in leading digital transformation. Prior to data collection, two experts reviewed the interview protocol in terms of language clarity, content relevance, and alignment with the research objectives. Data were analysed using thematic analysis. The participants were school leaders with relevant leadership experience, and their insights were considered valuable because expert perspectives can help identify emerging challenges and practical needs in a specific field.³³ After the interviews were transcribed and validated by the participants, the researchers read the transcripts repeatedly to become familiar with the data. Initial codes were then generated from meaningful statements related to digital leadership competencies, implementation challenges, leadership guidelines, and future leadership needs. These codes were grouped into broader categories and subsequently refined into themes. Braun and Clarke³⁴ describe thematic analysis as a flexible method for identifying, analysing, and reporting patterns within

²⁹ Robert K. Yin, *Case Study Research and Applications: Design and Methods* (Sage Publications, 2017).

³⁰ Bogdan and Biklen, *Qualitative Research*.

³¹ R. S. Robinson, "Purposive Sampling," in *Encyclopedia of Quality of Life and Well-Being Research*, ed. A. C. Michalos (Springer Netherlands, 2014), 5243-5245, https://doi.org/10.1007/978-94-007-0753-5_2337.

³² Merriam and Tisdell, *Qualitative Research*.

³³ David C. Berliner, "Expertise: The Wonders of Exemplary Performance," in *Creating Powerful Thinking in Teachers and Students* (1994), 161-186.

³⁴ Virginia Braun and Victoria Clarke, "Using Thematic Analysis in Psychology," *Qualitative Research in Psychology* 3, no. 2 (2006): 77-101, <https://doi.org/10.1191/1478088706qp0630a>.

qualitative data. In this study, recurring patterns across participants' responses were examined to support the development of themes. Thematic categorisation also helped organise the findings into a hierarchical framework that linked participants' experiences with broader conceptual meanings.³⁵

3. FINDINGS AND DISCUSSION

Findings

The analysis generated three interrelated themes: (i) competence in technology-related theories, (ii) the development of a guideline for school leadership, and (iii) the development of a guideline as a future reference for leaders. These themes indicated the need for a digital leadership model is not limited to technical knowledge alone. Instead, the findings suggested that school leaders require a combination of conceptual understanding, practical leadership guidance, and future-oriented direction to support digital transformation in Malaysian schools.

Theme 1: Competence in Technology-Related Theories

Theme 1 suggested that technological competence is the foundation of digital leadership. Participants emphasised that school leaders must understand technology-related theories before they can translate digital policies into school-level practice. This competence is important because digital leadership requires leaders to interpret national directions, guide teachers, and make informed decisions about the use of technology in administration and teaching.

"This is based on what the ministry has developed at the KPM level, so I think as a leader, one must master this technology or digital skills."

(P1T1C1: 98-100)

"...because currently, our management approach relies solely on verbal communication and physical materials, which fails to effectively influence the group we oversee."

(P3T1C1:141-143)

Moreover, P3 asserted that it was necessary for school leaders to have digital and technological proficiencies prior to their appointment as school leaders.

"I believe it is time for all administrators to master this skill before they are appointed as administrators."

(P3T1C1:145-147)

Furthermore, this theme suggested that school leaders should be able to distinguish between conventional ideas and practical implementation.

"...because currently, at the school level, we have commenced the incremental storage of data, although all of this has been developed by KPM."

(P1T1C2:100-102)

³⁵ Johnny Saldana, "Researcher, Analyze Thyself," *International Journal of Qualitative Methods* 17, no. 1 (2018): 1609406918801717.

These responses revealed that competence in technology-related theories functioned as a starting point for leadership action. Without sufficient conceptual and practical understanding, school leaders might struggle to guide teachers or implement digital initiatives consistently. Therefore, technological competence must be linked to a clear leadership guideline that helps leaders translate knowledge into practice.

Theme 2: Developing a Guideline for School Leadership

Theme 2 highlighted the need for a structured guideline that can provide practical direction for school leaders. Participants indicated that digital leadership cannot depend solely on individual initiative or personal interpretation. A standardised guideline is needed to help leaders understand their roles, coordinate digital practices, support teachers, and respond to school-level challenges in a more systematic manner. In this theme, the guideline refers to immediate operational guidance for planning, implementation, and teacher support.

“Upon my appointment as an administrator and leader, there existed no manual, no daily instructional guide for administrators, nothing.”

(P5T2C2:160-163)

Also, there was a lack of planning and no manual available. Regarding assistant principals, there were guidelines, but their applicability to contemporary educational institutions was in question.

P2 provided further details:

“...regarding the digital world, when these leaders have been invited and agreed to contribute their knowledge collectively, they will find it easier to expand this to the teachers they lead.”

(P2T2C2:94-97)

In addition, there was a necessity for a defined guideline to enhance visibility. School leaders could also utilise the guideline as a guide for proficient digital leadership.

“I consider the development of a digital model for leaders to be a suitable strategy, as I previously highlighted, given the prevalence of senior leaders at the school level.”

(P5T2C2:165-169)

This also suggested their need for a definitive paradigm to direct and support these leaders in the comprehensive execution of digital leadership.

“Future leaders must comprehend Malaysia’s needs.”

(P2T2C2:144)

“It is, for me, exceedingly significant. A digital leadership model for educational leaders guarantees that they comprehend their responsibilities and can support other educators in cultivating a digital culture within schools.”

(P4T2C2:116-118)

In short, the study participants believed that the establishment of a school leadership guideline could help convert technological competence into consistent leadership practice. Such a guideline could reduce uncertainty among school leaders by clarifying expectations, responsibilities, and strategies for implementing digital leadership. This finding also indicated that a digital leadership model should function not only as a conceptual framework but also as a practical tool for guiding leadership behaviours in schools.

Theme 3: Developing a Guideline as a Future Reference for Leaders

Theme 3 indicates that the proposed guideline should also serve as a future reference for school leaders. Participants viewed digital leadership as an ongoing requirement rather than a short-term response to technological change. Therefore, the model should prepare current and future leaders to respond to emerging digital needs, changing policy expectations, and the continuous development of educational technology. Unlike Theme 2, this theme emphasises continuity, adaptation, and preparation for future leadership needs.

“Future leaders must understand Malaysia’s present requirements. Previously designated as TVET for technical vocational requirements, Malaysia has recently transitioned towards digital advancements.”

(P2C3:144-146)

“Another issue is the infrastructure, or lack thereof. We request teachers to utilise [technology], although the infrastructure is inadequate.”

(P4C3:291-292)

The response from P4 also suggested that digital leadership was shaped by structural barriers. Even when teachers and leaders were encouraged to use technology, limited infrastructure could restrict implementation. This suggested that the development of a digital leadership model must consider unequal access to resources, differences in school readiness, and the digital divide between schools. Without addressing these barriers, digital leadership may remain difficult to implement consistently across different school contexts.

“Upon my appointment as an administrator and leader, there existed no daily instructional plan book for administrators. They lacked a guideline or model. Regarding assistant principals, there are indeed guidelines; however, are they applicable in contemporary educational institutions? To a certain degree, it depends on the individual leader to execute their responsibilities in their role as a leader.”

(P5C3:160-165)

Moreover, P5 believed that a standardised guideline could facilitate uniform implementation by school leaders and minimise discrepancies in the execution of directions throughout the organisation.

“Digital leadership must be unequivocal.’ It must be thorough. Only upon complete implementation will we observe the consequences and favourable outcomes. I contend that the digital model will facilitate school development, particularly in leadership, serving as a

paradigm for subordinates, be they teachers or staff, and eventually enhancing student outcomes. The effect will be apparent.”

(P5C3:172-177)

In conclusion, the three themes demonstrated that developing a digital leadership model requires integrating knowledge, practice, and future readiness. Competence in technology-related theories provides the foundation for understanding digital leadership, while a structured guideline helps school leaders translate this understanding into practical action. The need for a future-reference guideline further indicates that digital leadership must be sustainable and adaptable to evolving educational demands. Therefore, current school leaders should be supported to develop the competencies and guidance needed to lead digital transformation and cultivate future leaders who are aligned with the direction of Malaysian education.

Discussion

This study highlighted several key requirements for developing a digital leadership model for school leaders in Malaysia. The discussion is organised according to three principal themes: competence in technology-related theories, the development of a guideline for school leadership, and the development of a guideline for future leadership reference. Beyond identifying these themes, this section discusses how they reflect the practical, contextual, and structural challenges involved in implementing digital leadership in Malaysian schools.

Theme 1: Competence in Technology-Related Theories

i. Competence of technological theories

The findings of this study suggested that school leaders' understanding of technology-related theories is essential for effective digital leadership. This competence enables leaders to interpret digital policies, make informed decisions, and guide teachers in using technology for administrative and instructional purposes. P1 and P3 emphasised that technology proficiency is necessary for daily school operations and for improving the effectiveness of school management. This aligns with Robbins and Judge³⁶, who emphasise the importance of technological knowledge in contemporary leadership. However, technological knowledge alone is insufficient if leaders lack infrastructure, professional development, and a school culture that supports digital change.

ii. Distinguishing between theory and practice

The findings also highlighted the need for school leaders to distinguish between theoretical knowledge and practical implementation. Although national policies and digital initiatives provide broad direction, school leaders must translate these expectations into practices that suit their own school contexts. This process may be affected by teacher readiness, workload, access to digital resources, and resistance to change. Therefore, continuous training is needed not only to improve technical skills but also to help school leaders manage change, support teachers, and adapt digital strategies to the realities of their schools.

³⁶ Robbins and Judge, *Organizational Behavior*.

Theme 2: Developing a Guideline for School Leadership

i. The need for a standardised guideline

The findings revealed an immediate need for a standardised guideline that can support school leaders in carrying out their digital leadership responsibilities. Such a guideline is important because digital transformation requires more than individual initiative; it requires shared direction, consistent expectations, and practical implementation steps. According to participants, clear and organised guidance can help school leaders manage digital challenges more systematically. At the same time, the guideline must remain flexible enough to accommodate differences in school location, resource availability, teacher competence, and infrastructure readiness. These standards were essential for maintaining consistency in task execution and addressing challenges that emerge within educational institutions. According to P2 and P3, explicit and organised rules can assist school leaders in managing digital challenges more efficiently.

ii. A benchmark for leadership effectiveness

The findings further indicated the need for a benchmark to evaluate the effectiveness of digital leadership. School leaders need clear indicators to understand their roles in promoting digital culture, supporting teachers, managing resources, and improving school-level implementation. This aligns with Anderson and Dexter³⁷, who suggest that effective technology leadership can enhance teaching effectiveness. In the Malaysian context, however, such a benchmark should not only assess leadership performance but also consider contextual barriers such as infrastructure limitations, uneven resource distribution, and differences in digital readiness among schools.

Theme 3: Developing a Guideline for Future Leadership Reference

i. A reference for the future

The findings indicated the need for a guideline that can serve as a reference for future school leaders. Digital leadership should be viewed as a long-term leadership requirement rather than a temporary response to technological change. Current school leaders, therefore, have an important role in mentoring middle leaders and preparing them to understand the organisation's digital direction. This is necessary to ensure continuity, reduce dependency on individual leaders, and support sustainable digital transformation across schools.

ii. Comprehensive Implementation

The findings suggested that a standardised and detailed guideline could support more comprehensive implementation across the organisation. However, comprehensive implementation may be difficult if schools experience unequal access to infrastructure, limited technical support, or differences in staff readiness. P5's view that thorough implementation can support school leadership development is important, but such implementation must also address the digital divide between schools. Therefore, the proposed model should include not only leadership competencies, but also strategies for managing resource disparities, supporting teachers, and ensuring that digital leadership can be practised in diverse school contexts.

³⁷ Ronald E. Anderson and Sara Dexter, "School Technology Leadership: An Empirical Investigation of Prevalence and Effect," *Educational Administration Quarterly* 41, no. 1 (2005): 49-82.

Overall, the discussion shows that the development of a digital leadership model for Malaysian school leaders must balance three dimensions: knowledge, practice, and context. School leaders require technological competence, but they also need practical guidelines and institutional support to translate this competence into effective leadership. The model should therefore be responsive to socio-cultural conditions, infrastructure readiness, policy expectations, teacher readiness, and possible resistance to change. By considering these factors, the proposed model can provide a more realistic and context-sensitive foundation for strengthening digital leadership in Malaysian schools. Theoretically, the findings connect broad digital leadership expectations with the knowledge, practice, and contextual conditions identified by Malaysian school leaders. Practically, they indicate the areas that a subsequent model should address when guiding implementation across schools with different levels of readiness.

4. CONCLUSION

In the current leadership landscape, school leaders are required to manage multiple responsibilities while responding to the demands of digital transformation. In particular, school leaders must demonstrate dynamism, efficiency, effectiveness, and resilience in guiding digital education within a volatile, uncertain, complex, and ambiguous (VUCA) environment. The findings of this study indicated that Malaysian school leaders require a more structured digital leadership model that can guide them in translating national digital education policies into practical school-level implementation. Based on the findings, a digital leadership model developed subsequently from these findings should include three key components. First, it should strengthen school leaders' mastery of technology-related concepts so that they can understand, interpret, and apply digital leadership principles effectively. Second, it should provide clear and standardised guidelines for planning, implementing, monitoring, and evaluating digital initiatives in schools. Third, it should function as a future reference for school leaders by outlining leadership practices that are responsive to technological change, infrastructure readiness, teacher capacity, and the needs of different school contexts. These components are important to ensure that digital leadership is not limited to individual initiative but is supported by a systematic framework that can be used consistently across Malaysian schools.

This study also highlighted the need for continuous professional development, institutional support, and policy alignment to help school leaders adapt to technological advancement. These findings are consistent with the implementation of DPD, which aims to improve the digital proficiency of school leaders and strengthen the quality of digital education in Malaysia. Future research should focus on developing and piloting a digital leadership model based on these findings in different types of schools, including urban and rural settings, to examine its practicality and relevance. Longitudinal studies are also recommended to evaluate the long-term impact of the model on school leadership practices, teacher readiness, digital culture, and student learning support. In addition, future studies should develop clear evaluation metrics to assess the effectiveness of digital leadership programmes and determine how such programmes can be improved for broader implementation.

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