Principals' Perceptions of Their Role in Leading Digital Transformation: A Phenomenological Study

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ABSTRACT

Digital transformation in education presents distinct challenges for rural public schools in the Philippines, where geographic isolation, infrastructure deficits, and resource scarcity constrain principals' capacity to lead technological change. This study examines how primary school principals in a rural province in the Philippines perceive their role in leading digital transformation. Adopting a qualitative, interpretivist approach, this study used Interpretative Phenomenological Analysis to analyse semi-structured interviews with four school principals. Findings reveal four key themes: navigating infrastructure scarcity through resourcefulness, bridging generational and digital divides through distributed leadership, reconciling pedagogical innovation with socioeconomic realities, and cultivating adaptive cultures through consultative leadership. The study highlights inadequacies in top-down policies and underscores needs for sustained infrastructure investment, context-sensitive professional development, and formal recognition of distributed leadership in resource-constrained contexts.

Keywords: Digital Transformation, Educational Leadership, Rural Elementary Schools

INTRODUCTION

The digital transformation in education has emerged as a worldwide priority as educational systems adapt to technological advancements and societal shifts (Gabriel et al., 2022; Huang et al., 2024; Taglietti, 2020). This transformation extends beyond mere adoption of digital tools to encompass systemic changes in curriculum, pedagogy, and instructional practices (Gapoy-Landicho & Martir, 2024). Within this context, school principals emerge as pivotal change agents, responsible for modelling, resourcing, and sustaining technology use while shaping professional learning cultures (Banoğlu et al., 2022; Elkordy & Iovinelli, 2021). Principals' leadership plays a significant role in shaping teacher outcomes and school adaptability, particularly in navigating complex technological transitions (Xin et al., 2025; Navaridas-Nalda et al., 2020).

However, rural settings in developing countries present distinct challenges that constrain principals' capacity to lead digital transformation effectively such as limited connectivity, teacher digital skill gaps, and inequitable access to resources (Mustafa et al., 2024; Olanrewaju et al., 2021). Despite willingness and readiness among schools, rural schools often struggle with actual technology integration, which indicates a critical implementation gap (Mustafa et al., 2024; Rana et al., 2022).

This study concentrates on rural primary public schools in the Philippines and examines how principals perceive their role in leading digital transformation. It aims to address a timely policy and practice gap by exploring principals' understanding of digital transformation and its relevance to their schools, as well as identifying the opportunities and challenges they face in adopting digital tools.

The study is guided by the following research question:

How do principals in Philippine primary public schools in rural settings perceive their role in leading digital transformation in their schools?

LITERATURE REVIEW

The swift advancement of learning technologies has fundamentally altered educational paradigms across the globe, which has led educational leaders to reassess their roles and responsibilities (Rahimi & Oh, 2024; Sheninger, 2019). Understanding how school principals perceive their role in leading digital transformation is critically important for sustainable educational reform, particularly given the ongoing integration of tools (Alde, 2024). Challenges are particularly evident in rural areas in the Philippines, where archipelagic geography and urban-rural divides exacerbate infrastructure and connectivity gaps (Colicol & Colicol-Rodriguez, 2025; Laguador, 2021; Villaseñor, 2024), while leadership capacity remains a crucial factor influencing how school principals navigate and respond to the complex demands of digital transformation (Kilcoyne, 2024).

Defining Key Concept and Contexts

Digital transformation in educational settings represents a comprehensive, systemic change that integrates technology with organisational culture, pedagogical innovation, and sustained institutional reform (Lindqvist, 2019; Elkordy & Iovinelli, 2021; Voogt & McKenney, 2016). Unlike simple technology, digital transformation involves platformisation, collaborative practices, capacity building, and the cultivation of a digital culture across the entire school ecosystem (Willermark et al., 2023).

Contemporary literature employs overlapping terminology, including *digital leadership, e-leadership, and technological leadership*, to describe school principals' roles in facilitating ICT adoption and digital transformation (Chua & Chua, 2017; Peng et al., 2024; Yang, et al., 2025). These constructs share common elements: strategic vision, technological fluency, capacity to foster innovation, and commitment to a responsible and equitable digital access (Anwar & Saraih, 2024; Prathees, 2025).

However, this conceptual ambiguity carries practical implications. When terms are used interchangeably without clear differentiation, principals may struggle to interpret what is expected of them in practice. Unclear terminology can lead to inconsistent leadership standards (Okunlola & Suraiya, 2025). In rural contexts, where principals already juggle multiple administrative and instructional responsibilities, uncertainty in leadership expectations may further complicate efforts (Barbosa Jr. & Coneway, 2023; Dunham, 2012; Mette, 2024).

The Rural Context of Digital Transformation

Infrastructure and Connectivity

Rural digital transformation is constrained by uneven infrastructure, which limits continuous access to digital learning resources (Aruleba & Jere, 2022; Tahmasebi, 2023). Case studies in low-income countries report slow or non-existent internet and intermittent electricity as primary impediments to implementing learning management systems (Medina et al., 2025). Advanced network proposals promise technical remedies but require substantial policy coordination and investment to translate into classroom gains (Barrett et al., 2019; Timotheou et al., 2023). Early evidence in the rural Philippines suggests that offline learning materials may support educational outcomes in remote primary schools (Anuada & Macalisang, 2025), as well as using low-tech interventions in Botswana (Angrist et al., 2022), and thus constitute pragmatic infrastructure enabler where connectivity is weak. However, the magnitude of learning improvements and the effectiveness of content sharing is still emerging and requires more evaluation.

Teacher Capacity and Training

Teachers' skills play a crucial role in determining whether digital tools ensure teaching enhancement or are unlikely to make a difference (Singh et al., 2025). Studies that deploy Technological Pedagogical Content Knowledge (TPACK) frameworks emphasise the need for sustained, context-specific training, mentoring and locally relevant content to support teacher uptake (Yutong & Jamaludin, 2025). Studies of ICT-supported programmes show that local teachers play a vital role in making remote or streamed lessons work, and they therefore need support to adapt their ways of supporting learners (Chandramoulesh, 2025; Zhao, 2024). Evaluations of device distributions initiatives reveal that hardware provision without continued professional

development and technical assistance undermines educational impact (Amemasor et al., 2025; Zou et al., 2025) while combining teacher coaching with technology provision and community engagement produces gains in learning outcomes in rural primary contexts (Appiah-Okyere et al., 2023; de Hoop et al., 2023).

Socio-Economic and Socio-Cultural Barriers

Socio-economic constraints such as device affordability, unstable household income and competing child labour reduce students' capacity to benefit from digital learning in rural communities (Beatrice, 2023). High cost of personal devices and maintenance is reported as a principal barrier to equitable participation (Ojong, 2025). Social and community networks in rural areas may potentially mitigate the gaps in institutional support by drawing on community relationships and shared resources (Handoyo et al., 2024; Moloi & Dlomo, 2024). Also, sociocultural barriers such as the lack of locally adapted content and cultural perception, may hinder the adoption of learning technology in rural and disadvantaged areas (Festus & Emmanuel, 2025; Lopez, 2025; Shi & Ma, 2025). Whereas integrating culturally appropriate content produces learning gains in rural environments (Nedungadi et al., 2024).

Policy Frameworks and Enablers

Effective digital transformation requires flexible and balanced policies that invest in infrastructure, teacher development, and locally relevant resources, rather than focusing on a single component (Mustafa et al., 2024). While infrastructure is essential, a multifaceted approach emphasising training, policy, and leadership is crucial for effective and sustainable digital transformation (Apata et al., 2025). Effective digital support requires a comprehensive strategy that addresses policy, school-level resources and leadership, and classroom practices in an integrated manner (Timotheou et al., 2023). Integrated intervention in digital learning for rural schools is crucial such as practical infrastructure solutions, continuous teacher capacity building, socio-economic and cultural support, and school leadership (Aboderin, 2025; Wang & Huang, 2025).

The Philippine Case

The Department of Education (DepEd) has launched several initiatives aimed at integrating technology into public schools, most notably the 'DepEd Computerization Program' (DCP), which provides ICT laboratory packages to secondary and elementary schools with the goal of improving teaching and learning processes (DepEd, 2018). More recently, DepEd has promoted the 'Digital Rise Program' as a key platform for educational technology integration, emphasising digital literacy and infrastructure development (DepEd, 2024). However, recent studies reveal significant implementation challenges that undermine these initiatives' effectiveness particularly in rural contexts (Arrieta, 2020; Jaraula, 2025; Paran et al., 2024; Rodrigo, 2021). Teachers often lack sustained professional development in ICT pedagogy, resulting in underutilisation of digital tools for meaningful learning innovation (Paran et al., 2024; Prestoza, 2024). Further research also identify budget constraints and organisational change management gaps as critical barriers to digital transformation (Alde, 2024; Bete & Collera, 2025; Castillo, 2018; Lumagbas et al., 2019; Mastul et al., 2023).

School principals, while recognised as central to successful technology adoption through their strategic leadership and resource mobilisation roles, face substantial constraints including limited budgetary authority, competing administrative demands, and insufficient capacity-building support (Tanucan et al., 2022). These challenges are compounded by persistent gaps between policy intent and school-level implementation (Celeste & Nimfa, 2024; Jaraula, 2025). While DepEd's digital transformation agenda demonstrates governmental commitment to educational modernisation, systemic barriers related to infrastructure sustainability, professional capacity, and urban-rural equity continue to impede principals' ability to effectively lead digital change (Castro, 2023; Villaseñor, 2024).

Leadership Roles in Digital Transformation

Digital transformation requires shifts in pedagogy, organisational culture, and institutional capacity (Sheninger, 2019; Xin et al., 2025). Principals play a critical role in diagnosing problems, mobilising staff, and distributing expertise (Koh et al., 2023; Leithwood et al., 2008; Tsakeni et al., 2023). This study draws on *Adaptive*

Leadership (Heifetz et al., 2009) and *Distributed Leadership* (Harris, 2013; Spillane, 2005) to conceptualise how principals lead digital transformation under conditions of constraint. The following section outlines the leadership roles associated with these frameworks and clarifies how they inform the theoretical model presented in the next chapter.

Adaptive Leadership Roles

Role	How it reflects adaptive leadership principles	Key supporting evidence
Diagnosing technical vs adaptive challenges	Adaptive leaders distinguish fixable technical problems from deeper adaptive issues that require changes in values, practices and capacity (Heifetz et al., 2009), which guides where to invest capacity building rather than only hardware fixes .	Alene et al., 2025; Bhengu & Myende, 2016
Promoting experimentation and organisational learning	Adaptive leadership fosters small-scale experiments, iterative feedback and learning cycles so schools adapt pedagogies and processes (Dunn, 2020). For example, schools may adjust their practices in response to new digital affordances.	Lozano et al., 2023; Prayoonvong & Limwongthong, 2025
Managing conflict and engaging stakeholders	Adaptive approaches frame conflict as productive work, requiring leaders to surface tensions, engage stakeholders in sense-making, and mediate new norms (Kershner, & McQuillan, 2016).	Koukouvinou et al., 2023; Sarid, 2021; Sumiati et al., 2024
Mobilising people to work collectively	Adaptive leadership mobilises staff around shared problems by creating a compelling adaptive challenge and enabling collective problem-solving rather than top-down directives (Nelson & Squires, 2017).	Boylan, 2016; Tanio & Wibawanta, 2024

Table 1. Adaptive Leadership Roles and Supporting Literature

Distributed Leadership Roles

Distributed leadership complements adaptive work by enabling principals to draw on the expertise of teachers and staff, share responsibilities to reduce leadership overload, and facilitate collaborative decision-making in technology-driven change (Harris, 2013; Nadeem, 2024; Spillane, 2005). These practices are especially important in resource-limited and hierarchical contexts, where shared leadership structures help compensate for scarce capacity to respond to complex digital demands (Shabalala, 2025).

Principals enact distributed leadership when they deliberately tap teacher technician expertise for initiative leadership, allocate leadership tasks to reduce principal overload, and institutionalise collaborative governance structures (Nappi, 2014; Petersen, 2014). Distributed leadership studies of ICT integration report that shared leadership roles increase teacher participation, sustain instructional change, and allow strategic resource management (Ng & Ho, 2012;Tan & Ong, 2011).

Theoretical Implications and Gaps in the Current Literature

Adaptive Leadership and Distributed Leadership frameworks provide valuable theoretical lenses for understanding principals' roles in leading digital transformation, yet their application reveals critical limitations that expose gaps in existing literature. Both frameworks presuppose organisational conditions such as adequate time for iterative learning, sufficient resources for capacity building, flexible authority structure, and baseline digital competencies, that might be absent in Philippine contexts characterised by unreliable infrastructure,

limited budgetary autonomy, hierarchical systems, and uneven teacher capacity (Kim & Wargo, 2025; Mastul et al., 2023; Villaseñor, 2024).

This disjuncture between theoretical assumptions and rural realities suggests that existing leadership literature may not sufficiently account for how adaptive experimentation and distributed collaboration are constrained by material scarcity and structural inequities. While Adaptive and Distributed Leadership provide important insights, neither approach alone adequately captures how rural principals navigate digital transformation within such constraints. This study addresses this gap by examining how rural principals perceive and enact digital transformation leadership under these conditions. In response to this gap, it adopts an Integrated Adaptive-Distributed Leadership framework to analyse these lived experiences, which is presented in the Theoretical Framework.

THEORETICAL FRAMEWORK

To understand how principals in rural primary public schools perceive and respond to digital transformation challenges, this study draws on a framework that considers both the adaptive and distributed dimensions of school leadership. Accordingly, I adopt an Integrated Adaptive-Distributed Leadership framework that brings together Adaptive Leadership and Distributed Leadership to support interpretation of principals' experiences of leading digital transformation in their schools.

Adaptive leadership conceptualises leadership as sense making and mobilisation in complex change contexts (Heifetz et al., 2009). The theory distinguishes between two types of challenges: *technical and adaptive challenges* as demonstrated in Figure 1. In examining the interview data, Figure 1 served as a diagnostic tool to determine when principals perceive their challenges as technical issues needing prompt resolutions, as opposed to adaptive challenges requiring changes in school culture, teaching methods, or collective actions.

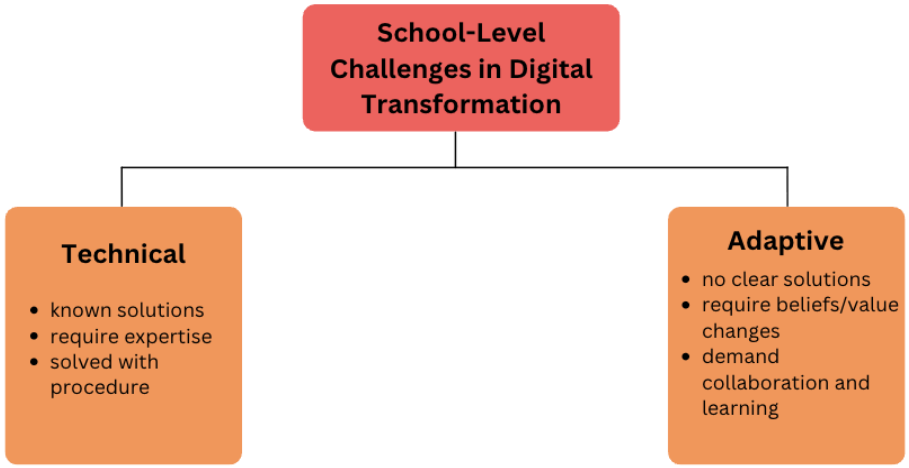

Figure 1. Technical vs. adaptive challenges (Heifetz et al., 2009)

In the context of digital transformation in education, Adaptive Leadership provides a helpful approach to understanding how leaders navigate the balance between technological innovation and organisational change (Kawiana, 2023; Yusoff et al., 2023). However, its application is shaped by contextual constraints, particularly in resource-limited rural and hierarchical school systems (Nugroho et al., 2025). Moreover, in rural Philippine schools, where decision-making typically flows from top to bottom, weak infrastructure and bureaucratic systems often limit the principal's adaptability to act independently (Almagro et al., 2025). Nevertheless, adaptive leadership remains valuable as it helps leaders mobilise people to face complex problems together (Sott and Bender, 2025). For instance, school administrators in the Philippines demonstrate resilience and strong leadership competencies that enable them to navigate challenges despite systemic and resource constraints (Malco, 2024).

Adaptive Leadership offers valuable perspectives, but questions remain as to whether it fully captures how leaders in resource-limited rural schools mobilise collective action. This constraint underscores the importance of integrating diverse leadership viewpoints that emphasise collaborative knowledge and collective accountability. In response to these limitations, *Distributed Leadership* is an approach that values collective effort over individual authority and recognises that real leadership emerges through collaboration, shared responsibility, and working together toward common goals (Harris, 2004). In the context of digital transformation, this means recognising that expertise in digital tools, pedagogy, and implementation may reside with various teachers, IT staff, or even students. For instance, in schools in Ghana, distributed leadership practices have been shown to alleviate head teacher burnout and reduce leadership overload showing the importance of shared responsibility in managing operations (Osei et al., 2025). However, while Distributed Leadership promotes collaboration by shared responsibility and decision-making, its success depends on how and why leadership is shared. This model goes beyond delegating tasks or flattening hierarchies; it relies on the quality of interactions, communication, and collective decision-making, and when poorly enacted, it may fail to bring real transformation (Harris & Spillane, 2008).

An Integrated Adaptive-Distributed Leadership Framework

This study adopts an Integrated Adaptive-Distributed Leadership framework that brings both leadership theories together and acts as an interpretive lens. As digital technologies continue to evolve, the challenges faced by schools also change, which requires leaders to respond to both technical demands and deeper organisational and cultural shifts. Adaptive Leadership provides a useful lens for understanding how leaders navigate complexity and uncertainty. When combined with Distributed Leadership, this framework supports interpretation of how leadership capacity is mobilised across organisation. *Figure 2* illustrates how the two theories intersect, which highlights that effective leadership in digital transformation involves both individual adaptability and collective collaboration. While Adaptive Leadership also acknowledges collaboration, Distributed Leadership extends this by emphasising the distribution of decision-making authority and responsibility across the organisation.

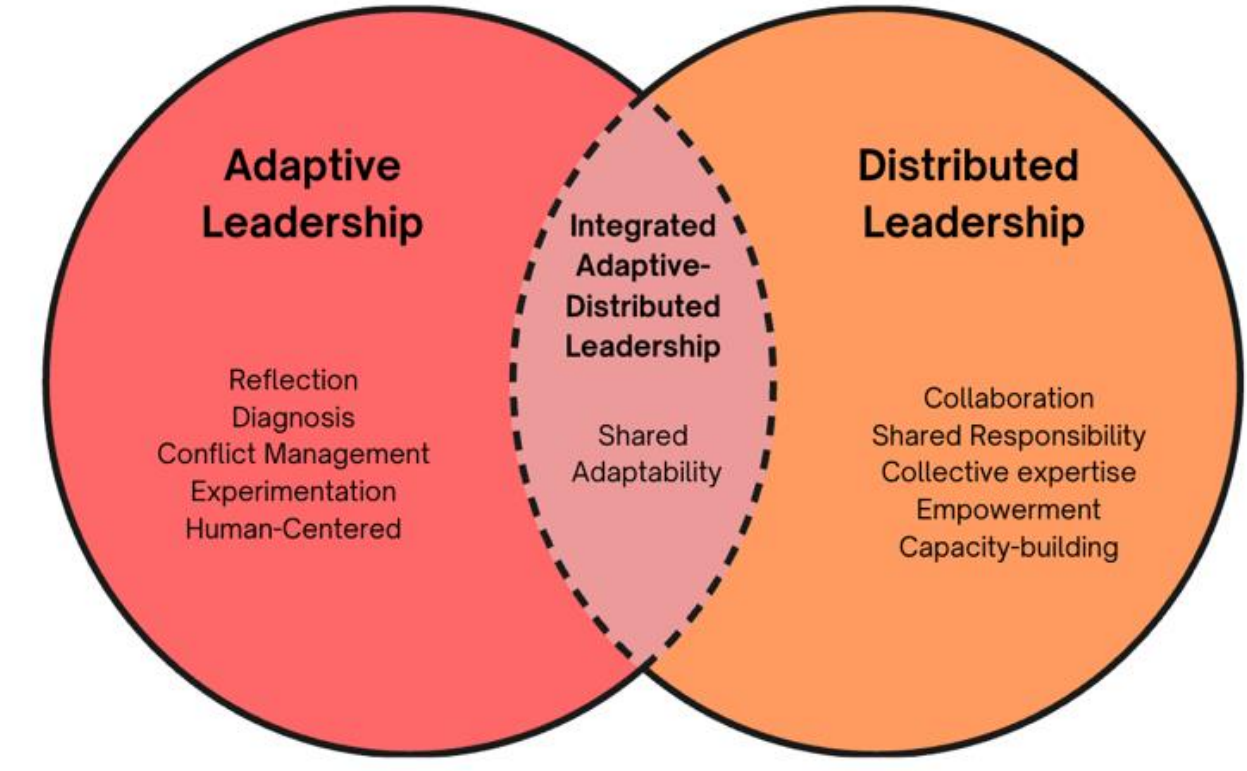

Figure 2. The Integrated Adaptive-Distributed Leadership Framework

The Integrated Adaptive-Distributed Leadership framework served as a dual interpretive lens that combined Adaptive and Distributed Leadership and facilitated the understanding of principals' lived experiences in the study. This integration enabled the exploration of how adaptive problem diagnosis and distributed mobilisation function in tandem within resource-limited rural school settings. By offering a context-sensitive approach to comprehending leadership in the domain of rural digital transformation, the framework provided theoretical insight into how leadership practices are shaped by infrastructure constraints and the interaction between schools and their communities. This study enhances the existing leadership literature by illustrating how adaptive and distributed practices are experienced and navigated in rural contexts with scarce resources.

METHODOLOGY

This study used a qualitative approach that follows interpretivist thinking. From an epistemological point of view, knowledge is understood as coming from people's experience and the meanings they give within their social world (Creswell, 2013). It was also informed by idealist ontological perspective, which holds reality is shaped by cultural context and personal experience (Otoo, 2020). While this way of studying provides depth and nuance, results are applied to the group or context examined, which makes wider generalisation difficult (Yanow, 2013). This limitation is particularly relevant in making policy and curriculum decisions in education that often rely on large-scale quantitative studies (van den Akker, 2010). Unlike positivist research, which seeks to uncover a single measurable reality through controlled and replicable methods (Park et al., 2020), interpretivist study gives a richer understanding of context and meaning, but the results are usually specific to the immediate setting and can be difficult to apply more broadly (Alharahsheh & Pius, 2020).

The study was framed by a phenomenological approach to explore how principals interpret and make sense of their experiences of digital transformation, as it enables rich insights into how principals navigate challenges and opportunities (Hugo et al., 2023; Sönmez et al., 2023). It specifically used the Interpretative Phenomenological Analysis (IPA) by Smith et al. (2009). IPA is particularly valuable in the analysis of this study because it goes beyond simply describing lived experiences, it also helps interpret the personal meaning that participants attach to those experiences (Smith et al., 2009). Recent phenomenological study of educational leaders in the Philippines highlights the difficulties they face when implementing policies and managing change and shows how this approach helps reveal the detailed and context-bound nature of leadership (Ainin et al., 2024). However, phenomenological approach can be criticised for being too descriptive but does not always explain the broader structural or policy issues that influence those experiences (Annisa, 2024; Pringle et al., 2011).

Research Design

Data Collection

For this study, data are gathered through one-to-one online semi-structured interviews, each lasting approximately 60-70 minutes, with four primary public school principals from rural schools within a single province in the Philippines, conducted via Microsoft Teams. Given the geographical distance between the researcher and participants, an online format enabled access to principals in rural areas. Interview questions followed the study's aims, informed by Adaptive Leadership, Distributed Leadership Theory and relevant literature. Participants are selected through purposive sampling.

Data Analysis

The data from the interviews were analysed through IPA (Smith et al., 2009). NVivo software supported the organisation of transcripts, coding, and theme development but did not replace the interpretation. The analysis followed the stages of IPA, as illustrated in Figure 3. In accordance with IPA conventions, each transcript was examined separately through repeated reading, initial noting, and the development of emergent themes. Cross-case analysis was conducted to uncover common patterns while maintaining individual details. A key consideration in IPA is its double hermeneutic, where researcher's interpretations play a central role; however, this can be addressed through reflexivity, member checking, and grounding themes in participants' words (Smith & Osborn, 2007).

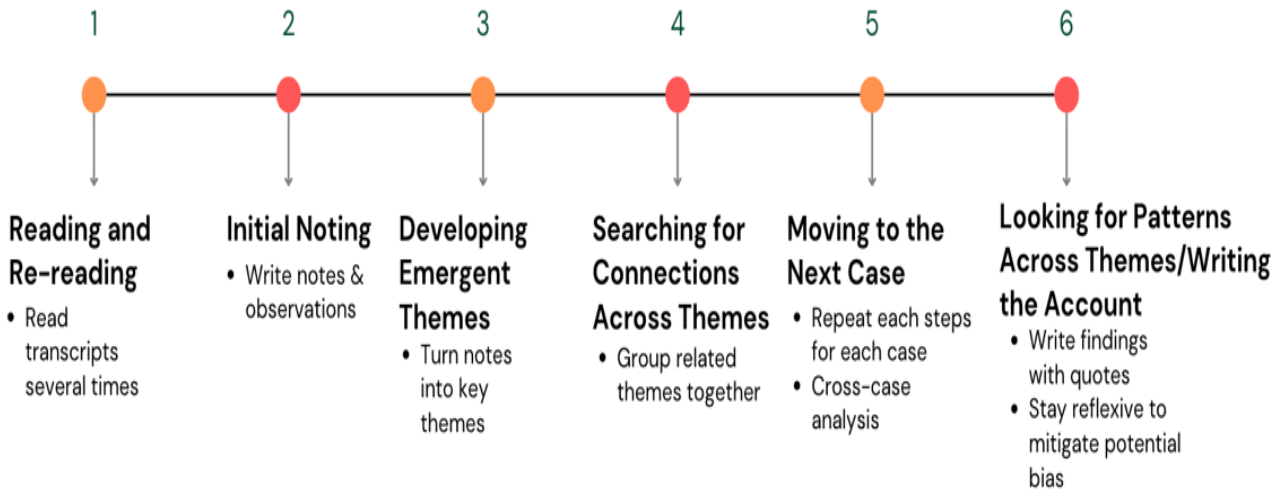

Figure 3. Stages of IPA. Adapted from Pietkiewicz & Smith (2014)

While IPA served as the main analytical method, the *Integrated Adaptive-Distributed Leadership* framework was used as an interpretive lens during the interpretation process, rather than an independent analytical strategy. All themes were derived inductively through the IPA procedure; nonetheless, the Adaptive-Distributed Leadership framework enhanced the understanding of these themes by highlighting examples of adaptive problem-solving, collaborative distribution, and the interaction between the two in the narratives of principals. This methodology ensured that the analysis was deeply anchored in the lived experiences of participants while enabling the findings to be contextually interpreted in relation to leadership practices within the landscape of rural digital transformation.

FINDINGS

Analysis of interviews revealed four superordinate themes that describe their experiences of leading digital transformation in resource-constrained contexts. Interviews were conducted in Tagalog and subsequently translated into English for analysis. Emergent themes were generated inductively through IPA and informed the superordinate themes. Interpretation of these themes, elaborated further in the Discussion and Conclusion, was informed by the Integrated Adaptive-Distributed Leadership framework. This supported sense-making around how principals identified challenges, engaged others, and distributed leadership practices.

Theme 1: Navigating Infrastructure Scarcity Through Resourcefulness

All four principals articulated profound struggles with basic digital infrastructure yet demonstrated remarkable adaptive ingenuity in addressing these constraints. Principal A travels to a roadside location with "Piso Wi-Fi", where one can pay per hour of internet connection from a small store, when the internet connection in their school is unstable. This illustrates connectivity instability in rural areas. Principal D's experience was striking: *"When I arrived here, there was no internet…we had to search for signal in different parts of the school"*.

Principal D further emphasised that persistent resource limitation shaped a shared mindset among teachers. He explained that teachers were "*very flexible when there is a lack of resources for the students…the teachers will seek support in the community*". This account emphasises that the experience of resource scarcity was perceived not merely as a limitation, but also as a driving force for adaptability and collaborative problem-solving within the school community.

Resourcefulness extended beyond connectivity. Principal B explained their workaround for insufficient devices: *"The teachers let their learners hold their laptops one by one".* Similarly, Principal C noted that while the DepEd's DCP was beneficial, *"not everything is given…it was like 10 years ago. Now, it's gone"*. This theme highlights how principals reframed technical problems as opportunities for partnership-building, mobilising resources beyond traditional bureaucratic channels.

Theme 2: Bridging Generational and Digital Divides Through Distributed Leadership

Principals enacted distributed leadership by strategically allocating responsibilities according to teachers' technological competencies, building collective capacity across generational and skill divides. Principal B reflected: *"If the teachers are still in the young generation…it's easy for them to follow, and they are well-versed in technology".* However, she acknowledged previous challenges with teachers approaching retirement.

To address disparities, principals employed empowering strategies. Principal B described deliberately assigning leadership roles to less confident teachers: *"When the teachers are like that, I make a project to make them confident…this is your coordination role, you're in charge of that."* Likewise, Principal A noted that the use of "*mentoring and coaching*" to support teachers with varying levels of digital confidence. Principal D's candid admission of his own learning journey created solidarity with struggling teachers: *"I admit to myself that I am not 100% a digital native…very stressful on the part of teachers and school administrators to use this technology without proper training".*

Theme 3: Reconciling Pedagogical Innovation with Socioeconomic Realities

A tension emerged between principals' aspirations for future-ready students and harsh realities of rural poverty. Principal A expressed: "*The children need to be fully equipped and enhanced when it comes to digital technology…everything is digital now, even ordering your food."* Yet this clashed with material constraints. Principal D noted: *"Many households have no internet connection…some really live in the far mountains."* Principal B advised teachers to "*download it so that in front of the learners they can play it*", acknowledging that "*not all children have gadgets and internet connections…when they come here to school, they get to experience these things".*

Principal D added that although DepEd's Learning Resource Management System provides ready-made digital materials that teachers can simply download, these are "*not always suitable for the learners' needs"*, requiring teachers to adapt and modify lessons. This reveals how principals mediate between policy expectation and community realities, ensuring equity despite home environment limitations. Principal C articulated the broader equity concern: "*In Manila, they provide tables for the learners…but in rural areas, it's hard. You have to wait for the government to give you the DCP packages, but it takes years."* Principal C also emphasised the continued use of "real objects" in teaching to ensure learning remains inclusive, noting that "*not all learners have access to digital tools*".

Theme 4: Cultivating Adaptive Cultures Through Consultative Leadership

All four principals emphasised consultation and shared decision-making. Principal B articulated: "*Before we come up with activities or projects, we always have consultations*," noting that this helps prevent situations where teachers later raise disagreements on social media platform. This proactive approach prevents resistance by ensuring stakeholder buy-in.

Principals demonstrated adaptive leadership by distinguishing between technical and adaptive challenges. When faced with broken equipment, they acknowledged these as "*minor*" problems that could be addressed either internally by teachers or externally through technicians, depending on issues such as printer malfunction or router problems.

However, deeper challenges such as building digital confidence and addressing socioeconomic barriers, required different approaches. All four principals explained that they "*send their teachers to workshop and seminar*" offered by DepEd when teachers feel unsure or need further support in specific skills such as using digital tools.

This theme also encompassed ethical considerations. Principal B established clear boundaries: *"Since I became a teacher, I don't really accept friend requests from students,"* advising parents to be "*responsible in using social media*". The consultative approach extended to sustainability planning. Principal B noted, "*We always have plan B*," reflecting adaptive leadership's emphasis on anticipating challenges and building organisational resilience.

Across the four themes, the Integrated Adaptive-Distributed Leadership framework made visible how Adaptive and Distributed Leadership practices were not separate processes but intertwined strategies that principals used to navigate the complexities of digital transformation in rural schools.

DISCUSSION AND CONCLUSION

This study explored how principals in rural Philippine public primary schools perceive and enact leadership in the context of digital transformation under resource constraints. Based on the lived experiences of the participants, the results shed light on how Adaptive and Distributed Leadership practices are interpreted, influenced, and occasionally hindered by material, organisational, and socio-cultural factors. In this way, the study contributes nuanced insights into the relevance and limitations of established leadership theories when applied to educational settings with scarce resources. The results highlight both the opportunities and challenges associated with technology-driven educational reform in rural areas. Throughout the findings, the narratives from principals illustrate a distinct struggle between their ambitions for digital transformation and the actual implementation of technology integration, influenced by infrastructural, socio-economic, and contextual limitations in rural educational environments. Amidst this tension, principals' resourcefulness served as a means of adaptive sense-making, through which infrastructural limitations came to be understood not merely as constraints but as prospects for collaboration, improvisation, and community involvement.

Adaptive Leadership in Practice: The principals' experiences exemplify Heifetz *et al.'s* (2009) distinction between technical and adaptive challenges. While technical issues such as malfunctioning equipment or connectivity, could be addressed through troubleshooting, deeper adaptive challenges required cultural shifts, capacity building, and stakeholders' engagement. Principals demonstrated adaptive leadership by diagnosing complex problems, recognising that digital transformation is not merely a technical upgrade but systemic change requiring shifts in pedagogy, mindset, and organisational culture.

Distributed Leadership as Necessity: The findings strongly support Harris's (2013) distributed leadership framework. In rural contexts where resources are scarce and principals lack formal technical expertise, distributed leadership emerges as practical necessity. By empowering ICT coordinators, younger teachers, and external stakeholders, principals expanded collective capacity to navigate digital transformation. This distribution built resilience, ensuring digital initiatives did not depend solely on the principals' knowledge.

Cultural Nuances: The principals' emphasis on consultation reflects Filipino cultural values of *pakikisama* (getting along) and *bayanihan* (communal unity). This culturally grounded leadership facilitated stakeholder buy-in and reduced resistance, suggesting that effective digital transformation strategies must be culturally responsive rather than imposing universal models.

Implications

The findings underscore inadequacy of top-down digital transformation policies assuming uniform infrastructure. Principals' reliance on private donations reveals systematic gaps in government support. While their resourcefulness is commendable, it should not substitute for equitable, sustained public investment in rural education infrastructure. Policymakers must address structural inequities forcing rural principals to become fundraisers rather than focusing on management and leadership. Furthermore, principals' accounts highlight the need for ongoing context-specific professional development. Principal D's pandemic experience on being thrust into facilitating training on unfamiliar platforms, illustrates inadequacy of one-size-fits-all training models. Effective professional development must be iterative, practice-based, and sensitive to varying digital literacy levels (Amemasor et al., 2025).

Rural school principals navigate the challenges of digital transformation through leadership practices characterised by resourcefulness, shared responsibility, pedagogical pragmatism, and consultative decision-making. Interpreted through the Integrated Adaptive-Leadership framework, their experiences suggest that effective digital leadership in resource-limited environments emerges not from the application of a single leadership approach, but from the dynamic interaction between adaptive problem-solving and the distributed mobilisation of collective capacity. While these principals demonstrate considerable resilience, their efforts also

highlight the need for systemic reforms to address infrastructure inequities, provide context-sensitive professional development, and recognise the distinct leadership challenges faced by rural schools undergoing digital transformation.

RECOMMENDATIONS

Based on the principals' lived experiences of leading digital transformation in resource-constrained rural Philippine primary schools, several recommendations emerge:

First, education authorities must establish sustained, equitable infrastructure investment programme that address connectivity deficits and hardware provision, reducing principals' reliance on private donations and fundraising.

Second, professional development initiatives should adopt iterative, practice-based models that are context-sensitive and responsive to varying digital literacy levels among both principals and teachers, moving beyond one-size-fits-all training approaches.

Third, policy frameworks should formally recognise and support Distributed Leadership structures by institutionalising ICT coordinator roles and creating collaborative networks that enable knowledge-sharing across rural schools.

Fourth, community engagement mechanisms should be strengthened through structured partnerships that leverage local resources while respecting cultural values of *pakikisama* (getting along) and *bayanihan* (communal unity). Finally, principals require dedicated support in distinguishing and addressing both technical and adaptive challenges, enabling them to focus on pedagogical transformation rather than solely troubleshooting infrastructure failures.

Consideration for Further Research

Future research should extend these findings through comparative qualitative studies examining rural-urban differences in principals' digital leadership experiences within the Philippines, that could reveal how infrastructure disparities shape leadership practices across contexts. Longitudinal qualitative designs would capture how principals' perceptions and practices evolve as digital transformation progresses, particularly following infrastructure improvements or policy interventions. Expanding the phenomenological lens to include teachers, ICT coordinators, and community stakeholders would provide insights from multiple perspectives on how distributed leadership operated digital transformation. Additionally, cross-national studies comparing principals' experiences across Southeast Asian developing context could reveal culturally situated leadership practices while identifying common challenges in resource-constrained settings.

Ethical Approval

This study sought approval from the University's Ethics Committee. After approval, participants were provided with an information sheet describing the study and their rights, and consent was obtained to ensure participation is voluntary and confidential. Participants are assigned pseudonyms (Principal A-D), and school or location identifiers are intentionally omitted to protect confidentiality. Risks were managed by assuring confidentiality, framing the study as developmental rather than evaluative. A Data Protection Impact Assessment was submitted to and approved by the University's Data Protection Officer and was included as part of the University's ethics application. Lastly, Philippine cultural norms, particularly respect for hierarchy, are observed throughout the interviews. It is guided by commitments to equity and inclusion and seeks to represent principals' voices ethically while maintaining reflexivity (Sirris, 2022).

Limitations of the study

This study has some methodological limitations due to its IPA design. The small, purposive sample of four principals, while appropriate for in-depth phenomenological inquiry, limits transferability to broader contexts beyond rural Philippine public primary schools. The study's findings are contextually specific to a particular

geographic, cultural, and infrastructural settings, and may not reflect experiences in urban areas or other developing nations. Translations from Tagalog to English, though carefully conducted, introduce potential interpretive nuances. The study does not claim generalisability but rather offers rich, contextualised insights into a specific phenomenon.

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