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Digital Leadership Pioneers: Navigating Outstanding School Principals' Successes in the Evolving Educational Landscape

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Abstract. The need for a comprehensive study on digital leadership in education, particularly in developing countries such as the Philippines, arose from a critical gap in the literature. Despite the widespread adoption of digital technologies, limited empirical research explored the specific practices, challenges, and strategies of school leaders in urban settings. This study examined the leadership behaviors, strategies, and outcomes associated with successful technology adoption in schools, focusing on visionary principals in the Division of City Schools, Manila. Using a qualitative descriptive research design, it captured the lived experiences of six purposively selected school principals recognized for their success in leading digital transformation. Data were collected through semi-structured interviews, document analysis, and classroom observations, ensuring a comprehensive understanding of digital leadership practices. Thematic analysis identified recurring patterns, revealing that effective digital leaders exhibit visionary leadership, collaborative management, adaptability, and strategic resource allocation to drive technology integration. Their leadership resulted in enhanced student learning, improved school climate, and increased teacher morale. The study underscores the pivotal role of school principals in fostering digital literacy, promoting innovation, and addressing infrastructure challenges. It contributes to policy development by offering a framework for digital leadership, guiding future leaders and policymakers in designing strategic interventions for sustainable technology-driven education. Recommendations include investment in ICT infrastructure, continuous professional development for educators, and policies ensuring equitable access to digital tools.

Keywords: Digital Leadership; Educational Leadership; Technology Integration in Education; Leadership Strategies in Education; Framework for Digital Leadership Practices

1. Introduction

Integrating digital technologies into educational environments signifies a pivotal transformation in teaching and learning processes, necessitating a reevaluation of leadership roles within academic institutions. This shift demands that school leaders embrace digital tools to bolster educational outcomes and navigate the

intricate landscape of global educational reforms effectively. The imperative for adept digital leadership is underscored by successful case studies that explored the impact of 1:1 iPad programs in Canadian school districts (Karsenti & Bugmann, 2017). Kirkpatrick (2018) found mixed effects on student achievement, while Willocks (2014) reported positive learning opportunities and motivation outcomes. The programs were also found to support equity and inclusion (Kirkpatrick, 2017) and positively impact student learning (Johnson, 2013). However, challenges such as off-task behaviors (Willocks, 2014), the need for infrastructure and professional development (Crichton, 2012; Johnson, 2013), and the potential for inequitable distribution (Thieman, 2017) were also identified. Despite these challenges, the programs could potentially transform pedagogy and learning environments (Geer, 2017; Thumlert, 2018). The studies have significantly enhanced student engagement and learning outcomes. These instances exemplify the transformative power of visionary leadership paired with strategic technology implementation, highlighting the essential role of leadership in aligning technological advancements with pedagogical objectives to cultivate 21st-century learning environments.

Furthermore, the disparity in digital education leadership challenges between developed and developing countries presents a complex spectrum of considerations, from resource abundance to innovative solutions necessitated by resource scarcity in the latter. With its unique blend of socio-economic, cultural, and infrastructural factors, the Manila context offers a distinctive case for examining digital leadership. Studies reveal how urban school leaders in Manila have adeptly navigated these challenges through community partnerships and innovative funding models, underscoring the strategic adaptability and nuanced understanding required for effective digital leadership (Tanucan, Negrido, & Malaga, 2023). Additionally, the emphasis on equitable access and digital literacy, as seen in digital literacy initiatives within Manila schools, is crucial for realizing the broader implications of digital leadership in developing countries.

The evolving narrative of digital leadership emphasizes the need for a nuanced, strategic approach to technology integration, mindful of both global trends and local realities. This study, set within the unique educational landscape of Division of City Schools, Manila, aimed to delve into outstanding school principals' lived experiences, challenges, and adaptive strategies, shedding light on the intricate dynamics of navigating digital transformation to enrich educational outcomes. By exploring these leadership journeys, this research aspired to contribute to the global discourse on educational leadership in the digital age, offering insights into fostering environments that support digital innovation and learning (Tanucan, Negrido, & Malaga, 2023).

1.1. The rationale of the Study

The rapid digital transformation in education demands visionary leadership, particularly in developing countries where resource limitations pose significant challenges. Despite the increasing reliance on digital tools, empirical research on how school leaders in urban, resource-constrained environments navigate digital integration remains scarce. Addressing this gap, this study examines the digital

leadership practices of outstanding school principals in the Division of City Schools, Manila, highlighting their strategies, challenges, and impact on educational outcomes.

Anchored in Transformational Leadership Theory (Burns, 1978; Bass, 1985) and Technology Leadership Theory (Anderson & Dexter, 2005), this study explores how school leaders foster innovation, build digital capacity, and enhance ICT infrastructures to create an inclusive and technology-driven learning environment. Furthermore, it extends theoretical discourse by integrating Fullan's (2014) Change Leadership Model and Puentedura's (2010) SAMR Model, emphasizing leadership adaptability, strategic ICT integration, and digital equity.

Through offering a framework for effective digital leadership, this research may contribute to both theory and practice, guiding policymakers in designing strategic interventions for digital literacy, ICT investment, and leadership development. Ultimately, this study seeks to bridge the empirical void in digital education leadership, providing locally relevant yet globally applicable insights into leading digital transformation in schools.

1.2. Conceptual Framework

The conceptual framework for this research on digital leadership in education, particularly among school principals in the Division of City Schools, Manila, synthesizes theoretical insights from **educational leadership, technology integration, and change management**. It articulates a multidimensional understanding of digital leadership, focusing on the competencies, practices, and systemic changes essential for navigating the digital transformation in educational settings.

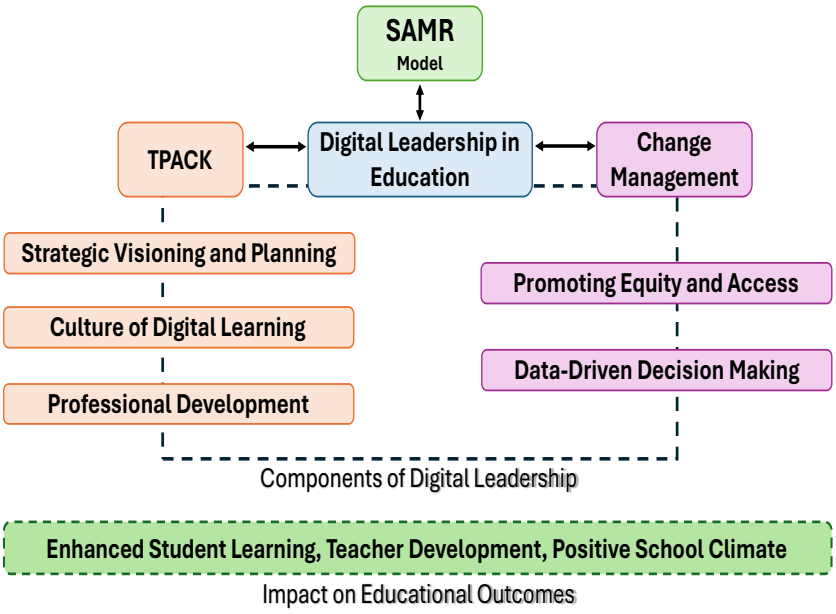

Figure 1. Conceptual Framework for Digital Leadership in Education

Figure 1 shows the visual representation to elucidate the complex dynamics of digital leadership in education, showcasing how theoretical models like **TPACK (Mishra & Koehler, 2006)** and **SAMR (Puentedura, 2010)**, along with **Change Management Principles (Fullan, 2001; Kotter, 1996)**, underpin effective digital leadership practices. Additionally, it highlights the importance of strategic components of digital leadership in driving positive educational outcomes, offering a comprehensive overview of the interrelations within the framework.

Encircling these elements is the **"Components of Digital Leadership,"** a dashed rectangle encapsulating several key facets vital to digital leadership practice. This includes **Strategic Visioning and Planning,** emphasizing the necessity of setting informed, strategic goals for technology use; **Culture of Digital Learning,** highlighting the creation of an environment conducive to digital innovation; **Professional Development,** aligning with **Fullan's (2001)** assertion that continuous learning for educators is crucial for sustainable change; **Data-Driven Decision Making,** focusing on the role of data in guiding leadership decisions; and **Promoting Equity and Access,** underscoring the commitment to ensuring equitable access to technology for all students. Though not interconnected by lines, these components are collectively positioned to signify their encompassment within the broader digital leadership framework.

Beneath this lies another dashed rectangle titled **"Impact on Educational Outcomes,"** capturing the transformative effects of digital leadership on education. This includes **enhancing student learning, developing teachers, and fostering a positive school climate**, illustrating that the interplay between digital leadership, its theoretical bases, and its core components culminates in substantial advancements in educational outcomes. This comprehensive representation underscores the multifaceted nature of digital leadership and its critical role in shaping the future of education through technology integration.

1.3. Research Questions

This study aimed to achieve the following objectives:

1. Identify the key characteristics and leadership behaviors of outstanding school principals who successfully integrate technology into their schools.
2. Explore the strategies and practices these principals employ to leverage technology for improved learning and student outcomes.
3. Explore the impact of successful digital leadership on student learning, school climate, and teacher morale within the Division of City Schools, Manila.
4. Develop a framework for understanding and replicating the success of these digital leadership pioneers, informing professional development programs, and supporting aspiring and current principals.

2. Literature Review

This portion extensively reviews the literature relevant to digital leadership in educational settings. It synthesizes research findings, theoretical frameworks, and

empirical studies to explore the intricacies of digital leadership and its impact on educational outcomes.

2.1 The Evolution of Digital Leadership in Education

The evolution of digital leadership in education is a complex and multifaceted process influenced by various factors. Karakose (2022) and Tigre (2022) provided comprehensive field analyses, identifying key themes and research clusters. Qolamani (2023) and Yuting (2022) focused on the specific impact of digital leadership in higher education, with Qolamani highlighting the potential of technology to enhance learning and Yuting emphasizing the need for e-leadership practices. Butler-Henderson (2020) and Cortellazzo (2019) explore leadership's role in the digital age, with Butler-Henderson emphasizing the importance of authentic leadership in empowering students and Cortellazzo highlighting the need for leaders to create a digital culture. Maheshwari (2020) and Solheim (2022) discuss the changing paradigms and challenges of leadership in the digital age. Maheshwari calls for new skills and competencies, and Solheim emphasizes the context-dependent nature of leadership in digital learning.

2.2 Leadership Practices and Strategies for Technology Integration

A range of studies have explored leadership practices and strategies for technology integration. Dexter (2020) and Torrato (2021) both emphasized the importance of professional development and support for teachers, with the latter also highlighting the role of school policy development. Larson (2020) and Băeşu (2020) provided broader perspective, discussing the impact of digital technologies on teamwork and the need for leaders to understand the digital revolution. Yanti (2020) and Blair (2020) focused on specific contexts, with the former offering practical techniques for technology integration in English language teaching and the latter discussing the requirements for leadership in the new technological society. Kurzhals (2020) and Pagano (2023) provided a more theoretical and practical perspective, with the former reviewing the relationship between strategic leadership and technological innovation and the latter offering strategies for managing technological change. These studies collectively highlight the need for leaders to support teachers, understand the digital revolution, and adapt to the new technological society.

2.3 Digital Leadership and Educational Outcomes

Many studies have explored the relationship between digital leadership and educational outcomes. Antonopoulou (2021) and Franciosi (2012) highlighted the importance of transformational leadership in higher education, particularly in digital culture. This leadership style is crucial for facilitating successful adaptation to technology-driven changes and innovation. Passey (2014) and Fedorova (2021) further emphasized the role of digital leaders, such as student digital leaders, in promoting positive outcomes in schools. Akcil (2017) and Gruzina (2020) focused on the skills and behaviors needed for digital leadership, particularly emphasizing technology acceptance, self-efficacy, and the transformation of hierarchical models into generative leadership models. Zhong (2017) and Rikkerink (2016) provided specific indicators and models for digital leadership in K-12 education, including the need for visionary leadership, a digital-age learning

culture, and the incorporation of distributed leadership and collective sense-making.

This review of related literature on digital leadership in educational settings offers a comprehensive exploration into the nuances of digital leadership and its profound impact on educational outcomes, spanning various levels and contexts of education. The literature presents a well-rounded understanding of the field, from the evolution of digital leadership through leadership practices for technology integration to the direct effects on educational outcomes. However, a discernible research gap emerges in the context-specific exploration of digital leadership within the unique educational landscape of Division of City Schools, Manila, particularly regarding the lived experiences and successes of school principals.

The evolution of digital leadership, as detailed by scholars like Karakose (2022) and Tigre (2022), along with the emphasis on higher education by Qolamani (2023) and Yuting (2022), provides a foundational understanding of digital leadership's broad impacts. However, these studies predominantly generalize digital leadership without delving into the specific challenges and strategies school principals employ in navigating the technological and educational reforms at the primary and secondary levels within a localized context.

Similarly, while the literature on leadership practices and strategies for technology integration, including works by Dexter (2020) and Torrato (2021), highlights the importance of professional development and policy development for successful technology integration, there remains a lacuna in examining how principals in Manila's schools actualize these practices. This region's specific technological, infrastructural, and socio-cultural challenges necessitate a tailored exploration of leadership strategies that transcend general recommendations.

Furthermore, studies focusing on digital leadership's impact on educational outcomes, like those by Antonopoulou (2021) and Franciosi (2012), underscored the critical role of transformational leadership in fostering technological adaptability and innovation. However, there is a need for more focus on the empirical linkage between specific digital leadership practices of school principals and measurable improvements in student learning, teacher development, and school climate within the Philippine educational framework.

Therefore, the research gap identified through this literature synthesis underscores the need for an in-depth qualitative study on the digital leadership practices of outstanding school principals in Division of City Schools, Manila. Such a study would provide context-specific insights into the challenges and successes of digital leadership in an urban Philippine setting while contributing to the global discourse on effective digital leadership. By examining the lived experiences, strategies, and achievements of these principals, the study, "*Digital Leadership Pioneers: A Qualitative Study of Outstanding School Principals' Successes in Navigating the Evolving Educational Landscape in D.C.S., Manila,*" seeks to bridge

this gap, offering valuable frameworks to inform policy and practice in similar contexts.

Additionally, the study assessed the impact of digital technology integration on student outcomes by analyzing key indicators such as engagement, academic performance, and digital literacy. It explored how school leaders leverage technology to enhance curriculum delivery, support differentiated instruction, and foster innovative learning environments. These insights may provide a comprehensive understanding of how digital leadership drives student success and institutional progress, reinforcing the need for strategic, evidence-based educational technology policies.

3. Methods

3.1. Research Design

This study adopted a descriptive qualitative case study approach to explore digital leadership among school principals in Division of City Schools, Manila, focusing on technology integration and leadership practices. This methodology provided an in-depth examination of real-world leadership behaviors, capturing the complexities of digital adoption, pedagogical adaptation, and administrative strategies. The descriptive nature of the study allowed for a structured portrayal of digital leadership practices within a specific urban educational context.

To measure the impact of digital leadership using qualitative data, the study relied on thematic analysis of semi-structured interviews, classroom observations, and document reviews. The impact was assessed through indicators such as perceived student engagement, teacher professional growth, and improvements in school climate, as reported by principals and corroborated through observed practices and institutional records. While qualitative research does not calculate effect size in numerical terms, the depth of responses and frequency of recurring themes helped gauge the magnitude of digital leadership's influence. Patterns emerging from the data provided qualitative effect sizes, represented by the strength of themes across multiple data sources, ensuring a robust interpretation of findings.

To ensure reliability and validity, the study employed triangulation, member checking, and peer debriefing. Triangulation involved cross-validating findings across interviews, observations, and document analysis. Member checking allowed participants to review and confirm their responses, ensuring accurate representation. Peer debriefing with educational leadership experts helped refine interpretations and reduce researcher bias. Additionally, a clear audit trail documented research decisions, ensuring transparency and methodological rigor. Despite challenges such as researcher reflexivity and subjective interpretation (Coimbra, 2013), qualitative case studies remain effective for evaluating educational programs (Fetterman, 1988) and examining school-oriented leadership dynamics (Kariyana, 2014). This study’s approach provides a rich, evidence-backed portrayal of digital leadership in Manila’s schools, offering insights applicable to broader educational contexts.

3.2. Population and Samples of the Study

This study focused on school principals from the Division of City Schools, Manila, recognized for their effective digital leadership in technology integration, instructional leadership, and school-wide digital transformation. The sampling frame consisted of a comprehensive list of school principals obtained from official Division of City Schools records, ensuring the selection of principals actively leading digital initiatives. Using a purposive sampling technique, six principals from high-performing schools were selected based on their proven success in technology-driven education. The sample size was determined following qualitative case study methodologies (Creswell & Creswell, 2017) to provide in-depth insights into digital leadership practices.

Selection was guided by inclusion criteria, requiring principals to lead established digital transformation programs, implement ICT-based teaching strategies, and have at least three years of leadership experience in digital integration. Principals from schools without documented digital initiatives or those not actively engaged in policy-making or administrative digital leadership were excluded. Conducted from October 2023 to February 2024, this study explored the lived experiences, strategies, and challenges of digital leadership, contributing a framework for best practices in urban educational settings.

3.3. Sampling Procedure

A purposive sampling technique was employed to select principals exemplifying best practices in digital leadership, allowing for a targeted approach focused on technology integration expertise. The sampling procedure involved three key steps: (1) Identification and Screening, where a comprehensive list of principals was compiled from Division of City Schools records based on digital transformation success, ICT integration leadership, and a positive school climate; (2) Validation Process, which included consultations with district officials and education experts to ensure selection accuracy and diverse representation; and (3) Final Selection and Ethical Considerations, where principals were formally invited, provided with ethical guidelines, and gave informed consent to ensure voluntary participation and confidentiality.

To mitigate biases, the study ensured diverse representation by selecting schools from varied locations, sizes, and socio-economic contexts. A blind review process was implemented during initial screening to minimize reputational biases, and stakeholder input from district officials and educators further refined the selection process, ensuring objectivity and methodological rigor. This rigorous approach reinforced the study's credibility and applicability, strengthening its contribution to digital leadership and technology-enhanced education research.

3.4. Research Instruments

The development of research instruments for this study was a critical process, ensuring methodological rigor, contextual relevance, and alignment with international qualitative research standards. The research instruments were meticulously designed to explore digital leadership among school principals in the Division of City Schools, Manila, through a triangulated approach comprising semi-structured interviews, document review, and classroom observations. This

multi-method strategy, supported by existing literature and validated by experts, provided a comprehensive and nuanced understanding of digital leadership in urban educational settings.

3.4.1 Semi-structured Interviews

Semi-structured interviews served as the primary method for gathering in-depth insights into principals' experiences, challenges, and successes in integrating digital technologies. The interview protocol was developed based on established theoretical frameworks in digital leadership, including Fullan (2001), Mishra and Koehler's (2006) TPACK model, and Puentedura's (2010) SAMR model.

The development process involved:

1. **Expert Validation –** The interview guide underwent expert review by educational leadership specialists to ensure conceptual clarity, relevance, and alignment with digital leadership constructs.
2. **Pilot Testing –** A preliminary round of interviews was conducted with a small sample of school principals outside the study cohort. Feedback from this phase led to refinements in question phrasing and scope.
3. **Contextual Adjustments –** The interview questions were tailored to reflect the digital infrastructure, policy environment, and socio-economic conditions of Manila's urban schools, ensuring context-specific applicability.

The interview guide covered four key dimensions:

- **Leadership Vision:** Strategies and philosophies regarding digital transformation in schools.
- **Technology Integration Strategies:** Approaches to digital tool adoption, teacher training, and infrastructure development.
- **Challenges and Solutions:** Barriers to technology adoption and strategies for overcoming them.
- **Impact on Learning and School Climate:** The perceived effects of digital leadership on student engagement, instructional quality, and institutional culture.

Open-ended and follow-up questions were incorporated to allow for deeper exploration of themes, capturing the lived experiences of school principals.

3.4.2 Document Review

Document analysis provided an additional layer of data triangulation, offering objective evidence of digital leadership practices. Documents were selected based on their relevance to the study's objectives and their potential to illuminate the policy, administrative, and instructional dimensions of digital transformation in schools. The document review process was structured around:

- **Technology Integration Plans:** Analyzing school-level strategies for implementing digital tools.
- **Professional Development Records:** Evaluating initiatives aimed at enhancing teachers' digital competencies.
- **Student Achievement Reports:** Identifying potential correlations between digital leadership practices and student performance.

- **School Policies and Memos:** Examining administrative decisions and policy directives related to digital transformation.

Each document was analyzed using a thematic coding framework to identify patterns, trends, and gaps in digital leadership implementation.

3.4.3 Classroom Observations

Classroom observations enabled the direct assessment of technology integration in instructional settings. A structured non-participant observation approach was employed to minimize disruption while capturing authentic interactions between teachers, students, and digital tools. The observation checklist focused on:

- **Teachers' Use of Digital Tools:** The extent and manner of technology integration in lesson delivery.
- **Student Engagement:** Levels of student participation and interaction with digital resources.
- **School-wide Digital Initiatives:** The implementation of ICT-based communication systems and e-learning platforms.

To enhance reliability, inter-rater agreement was ensured by training multiple observers and cross-validating observation data against interview and document review findings.

3.4.4 Methodological Rigor and Data Triangulation

To strengthen the validity and reliability of the research instruments, multiple strategies were employed:

- **Triangulation:** Combining interviews, document analysis, and observations to cross-verify findings (Creswell & Creswell, 2017).
- **Reflexivity:** Maintaining a researcher journal to document biases, interpretations, and methodological decisions (Lincoln & Guba, 1985).
- **Peer Debriefing:** Engaging research colleagues for critical feedback on data collection procedures and findings.

3.5. Validation and Refinement

Upon their initial drafting, the research instruments were subjected to a rigorous validation process that involved scrutiny by four experts, encompassing two specialists in qualitative research methodologies and two Department of Education (DepEd) supervisors renowned for their active engagement in qualitative studies. Additionally, a language expert was consulted to ensure clarity and coherence in the instruments' wording. This expert panel's feedback was instrumental in refining the interview guide, document review protocol, and classroom observation checklist, significantly improving their clarity, relevance, and capacity to elicit meaningful insights into digital leadership practices. Following this expert validation, a pilot test was conducted with a select group of school principals outside the main study cohort to further assess and enhance the instruments' applicability and effectiveness. This comprehensive validation and refinement process, underpinned by both academic literature and field-specific expertise, fortified the research tools, ensuring they were well-equipped to explore the complex dynamics of digital leadership within the educational landscape of Division of City Schools, Manila.

3.6. Data Gathering Procedure

The data collection process followed a structured approach to ensure accuracy and reliability.

1. **Preparation Phase –** The researcher secured necessary approvals from the Division of City Schools, Manila, and obtained informed consent from selected school principals. A schedule for data collection was coordinated with participants.
2. **Data Collection –** The researcher conducted interviews, gathered relevant documents, and observed classrooms over a specified period. Interviews were recorded and transcribed for analysis. Documents were collected and categorized, while observations were conducted using a structured checklist to maintain consistency.
3. **Validation and Triangulation –** After data collection, interviews were reviewed through member checking, allowing participants to verify their responses. Findings from different sources were cross-validated to ensure consistency and credibility. Peer debriefing with educational experts further refined interpretations and minimized bias.
4. **Data Organization and Storage –** All collected data were securely stored and systematically categorized for analysis. Transcriptions, notes, and documents were organized to facilitate thematic coding and interpretation.

This structured process ensured a rigorous and ethical approach to gathering data on digital leadership in Manila's schools.

3.8. Ethical Considerations and Confidentiality Measures

Across all data gathering methods, ethical considerations and confidentiality measures were paramount. The study adhered to ethical guidelines for research involving human subjects, ensuring that participation was voluntary, informed consent was obtained, and the anonymity and privacy of participants were protected (American Educational Research Association [AERA], 2011). Data storage and handling procedures were designed to ensure that all collected data were secure and accessible only to the research team, with electronic data encrypted and stored in password-protected files.

By implementing these rigorous ethical and confidentiality measures, the study aimed to uphold the highest standards of research integrity and respect for participants. These measures not only safeguarded the participants' rights and welfare but also enhanced the credibility and trustworthiness of the research findings.

3.9. Data Processing and Analysis

This study employed thematic analysis to analyze data from semi-structured interviews (primary), document reviews, and classroom observations (supplementary), ensuring a comprehensive and credible understanding of digital leadership among school principals in the Division of City Schools, Manila.

Trustworthiness and Triangulation
To establish credibility, dependability, and confirmability, the research instruments underwent expert validation, pilot testing, and iterative refinement. Triangulation was employed by cross-validating interviews (firsthand narratives), document reviews (institutional records), and classroom observations (practical validation of leadership practices). Member checking allowed participants to verify the accuracy of interpretations, while peer debriefing with educational leadership experts minimized researcher bias and enhanced reliability.

Thematic Analysis Procedure
The analysis followed a structured, iterative process to ensure methodological rigor:

1. **Data Familiarization** – The researcher immersed in the data by thoroughly reviewing interview transcripts, observation notes, and institutional documents, ensuring a deep understanding before coding.
2. **Initial Coding** – Data was segmented into meaningful units, with both deductive (theory-driven) and inductive (data-driven) coding applied. This approach allowed the identification of predefined concepts while remaining open to emerging insights.
3. **Theme Development** – Coded data were grouped into categories that reflected key aspects of digital leadership. Emerging themes were refined, ensuring coherence and distinctiveness.
4. **Theme Review and Refinement** – Themes were rigorously reviewed for consistency and alignment with the research objectives. Any discrepancies were resolved through iterative refinement.
5. **Defining and Naming Themes** – Themes were clearly articulated, ensuring they accurately represented the patterns in the data.
6. **Final Narrative Integration** – Themes were woven into a coherent narrative supported by direct excerpts from interviews, documents, and observations. Qualitative data analysis software assisted in managing and organizing the data for enhanced accuracy.

This approach ensured depth, credibility, and methodological rigor, reinforcing the reliability of the study's findings on digital leadership in urban educational settings.

4. Results

4.1. Key Characteristics and Leadership Behaviors of Digital Principals

The research findings underscore the essential characteristics and behaviors that define outstanding school principals who have successfully integrated digital technology in schools. The analysis revealed a shared commitment to visionary leadership, collaboration, adaptability, strategic resource allocation, and fostering a digital culture. These attributes collectively contribute to the effective implementation of technology-driven educational reforms.

4.1.1 Visionary Leadership
Principals demonstrated a forward-thinking mindset, envisioning the transformative potential of technology in enhancing student learning. Their

ability to set a strategic direction was instrumental in fostering an environment that embraced digital education. As highlighted in Fullan's (2014) Change Leadership Model, visionary leaders act as catalysts for meaningful transformation. This study corroborates Fullan's (2014) assertion by illustrating how Manila-based school principals established long-term technology integration goals that aligned with the evolving demands of the education sector.

One principal articulated, "My vision is for us to genuinely keep pace with the evolving landscape of 21st-century education, ensuring that our students here in the Philippines aren't left behind." This forward-thinking mindset was crucial for setting the direction and motivation for digital adoption within their schools.

4.1.2 Collaborative and Consultative Approach

The research aligns with Dexter's (2020) assertion that digital transformation in schools thrives in collaborative settings. The findings indicate that principals actively engaged teachers, ICT coordinators, and other stakeholders in decision-making processes. This participatory approach facilitated shared ownership of digital initiatives and increased the likelihood of successful implementation. Such collaboration mirrors the findings of Băeşu and Bejinaru (2020), who emphasized the role of distributed leadership in fostering technological innovation.

One principal highlighted, "I always make sure to consult with my teachers...It's not about being a lone wolf; I empower all my master teachers and teachers to be part of the decision-making process." This inclusive approach fosters a shared sense of ownership and commitment to the school's digital transformation goals.

4.1.3 Adaptability and Continuous Learning

The study found that adaptability was a defining trait among the principals. In line with Anderson and Dexter's (2005) Technology Leadership Theory, successful leaders exhibited a commitment to continuous learning. Their willingness to explore emerging digital tools and methodologies ensured that technology adoption remained relevant and effective. Prior research (Kirkpatrick, 2018) similarly highlights the necessity of adaptive leadership in addressing the rapidly evolving digital landscape in education.

"Even though I'm not that knowledgeable about technology, I ask questions and study," shared one principal, underscoring the importance of being a lifelong learner in the digital age.

4.1.4 Strategic Resource Allocation

Resource management emerged as a key competency among effective digital leaders. Given financial constraints in public education, principals employed strategic planning to allocate funds toward digital infrastructure, teacher training, and ICT resources. This approach aligns with the work of Passey (2014), which underscores the significance of data-driven decision-making in educational leadership.

"Procurements...We're talking about getting TVs, getting equipment to improve our internet connection," a principal stated, emphasizing the practical steps taken to equip their schools for digital learning.

4.2. Strategies for Technology-Driven Learning

School principals employed diverse strategies to integrate technology effectively, each tailored to their school's specific context. The research findings highlight five primary approaches:

4.2.1 Integration of Digital Platforms and Tools

The study reveals that platforms such as Google Classroom, school websites, and digital communication channels were widely adopted to enhance instructional delivery and streamline administrative processes. This corroborates findings from Yuting (2022), who identified similar digital transformation trends in educational institutions.

One principal shared, "We use platforms like Google Drive, school websites, pages, parent groups, teacher groups...almost everyone communicates through those platforms because they're faster and more convenient."

4.2.2 Professional Development and Training

A critical strategy observed was the emphasis on teacher capacity building. Principals organized training sessions on pedagogical applications of technology, ensuring that teachers could effectively integrate digital tools into their lessons. This is consistent with Maheshwari's (2020) call for targeted professional development in technology leadership.

By providing them with all their needs inside the classroom such as television and Wi-Fi connections, I also conduct class observations," one principal explained, highlighting efforts to equip teachers with the necessary digital skills and tools.

4.2.3 Infrastructure Enhancement

Investments in ICT infrastructure, such as interactive smartboards and high-speed internet connectivity, played a crucial role in supporting digital learning. Prior research by Crichton et al. (2012) affirms that infrastructure is a foundational element in successful technology integration efforts.

4.2.4 Encouraging Innovation and Creativity

Principals encouraged teachers to experiment with digital tools and explore innovative teaching methodologies. "They use videos, they use...let's say things they know how to do like the teacher broadcasters...It's that simple; they can use it. We just need to integrate it," shared one principal, demonstrating an openness to new and innovative teaching practices.

4.3. Impact on Learning, School Climate, and Teacher Morale.

In analyzing the impact of successful digital leadership on student learning, school climate, and teacher morale within the schools of Division of City Schools, Manila, the comprehensive insights gleaned from the interviews with school principals revealed a multifaceted transformation. These leaders have not only

embraced but also skillfully navigated the complexities of integrating digital technologies into the educational sphere, bringing about significant advancements in educational outcomes, fostering a positive and inclusive school environment, and enhancing teacher engagement and morale.

4.3.1 Impact on Student Learning

School principals reported significant improvements in student learning outcomes due to digital tool integration. One principal noted, "With digital technology, things have become much easier, especially for teachers. It's more engaging for the kids." Increased student motivation, higher test scores, and greater classroom participation reflect this impact.

4.3.2 School Climate and Teacher Morale

The transition to a digitally enhanced learning environment has also positively influenced the school climate. "I found that they had already accepted it...The pandemic acted as a sort of catalyst for us," remarked one principal, highlighting the shift towards a culture more open to change and innovation.

Digital leadership has had a profound impact on teacher morale. "Teachers collaborate with their colleagues... This collaborative effort simplifies their work," noted Principal A, emphasizing the positive effects of digital initiatives on workload and teamwork.

4.4. A Framework for Digital Leadership in Education

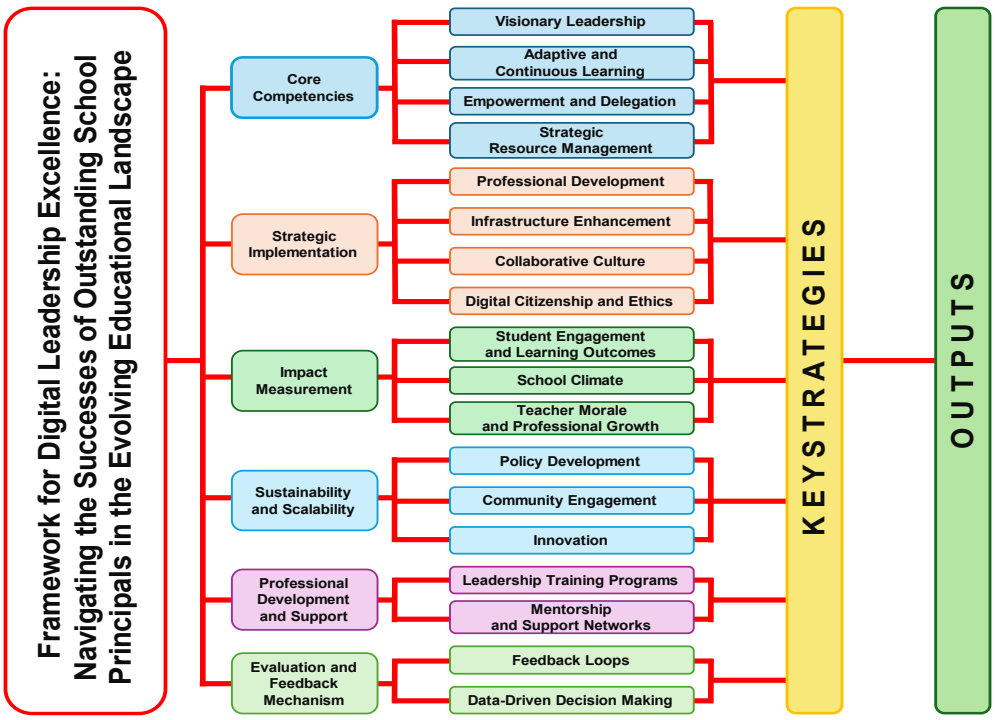

Figure 1. Proposed Framework

The framework highlights key competencies and strategies for effective digital leadership among school principals. It emphasizes visionary leadership,

adaptability, empowerment, and professional development as core foundations. Through strategic implementation, principals enhance infrastructure, digital culture, and ethical practices to improve student learning and school climate.

The model ensures sustainability through policy development and community engagement while using data-driven decision-making and feedback loops for continuous improvement. Through adopting this framework, professional development programs can guide current and aspiring principals in successfully leading digital transformation in schools.

5. Conclusions

This study examined the digital leadership practices of outstanding school principals in the Division of City Schools, Manila. By analyzing their leadership behaviors, challenges, strategies, and impacts, the research provided valuable insights into how digital transformation is successfully implemented in schools. The conclusions drawn from the findings address the research problem formulation as follows:

1. The findings of this study highlight the pivotal role of outstanding school principals in navigating digital transformation within the Division of City Schools, Manila. Addressing the first research problem, the study revealed that these leaders employ a strategic approach to digital leadership by integrating innovative technologies, fostering digital literacy, and strengthening ICT infrastructure. Their leadership style, anchored in transformational and technology leadership theories, enables them to create inclusive and technology-driven learning environments.
2. The challenges faced by these principals include limited funding, resistance to change, and gaps in digital skills among teachers and students. However, they overcame these obstacles through strategic partnerships, professional development programs, and adaptive leadership strategies, showcasing resilience and innovation in addressing digital education gaps.
3. The impact of digital leadership on student learning, school climate, and teacher morale was evident. The integration of digital tools enhanced student engagement, improved academic performance, and fostered an interactive learning experience. Additionally, the shift to a digital-driven environment cultivated a more collaborative and supportive school climate, while teacher morale was significantly boosted through capacity-building initiatives and access to digital resources.
4. Lastly, the successful implementation of digital projects and initiatives, such as Plaridel TV, underscores the effectiveness of digital leadership in transforming educational practices. These projects not only modernized instructional delivery but also provided a platform for innovative teaching strategies, ultimately contributing to improved educational outcomes.

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