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Digital Leadership: Shaping Public School Governance in Administrative and Instructional Efficacy

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ABSTRACT

Digital transformation in schools depends on leadership that connects technology with administration, instruction, staff capability, and accountable governance. This study examined perceived digital leadership and technology-enabled governance in four public schools in District II, Division of Talisay City, Cebu, Philippines. Methods: A descriptive-correlational, cross-sectional survey was conducted during School Year 2025-2026. The study disclosed random selection of 104 school personnel, with 26 respondents from each school. A modified questionnaire measured five digital-leadership domains (innovation, assessment, forecasting, management, and transfer) and two governance domains (administrative functions and instructional leadership efficacy) on five-point agreement scales. Frequencies, percentages, weighted means, standard deviations, and chi-square test were revealed. Overall digital leadership was rated positively (M = 4.00, SD = 0.77). Innovation received the highest domain mean (M = 4.11), whereas forecasting (M = 3.92) and transfer (M = 3.95) were comparatively lower. Technology-enabled governance was rated strongly (M = 4.24, SD = 0.77), with administrative functions (M = 4.26) slightly exceeding instructional leadership efficacy (M = 4.22). The study reported a statistically significant relationship and rejection of the null hypothesis at alpha = .05 (test statistic = 10.43; stated critical value = 2.0176). However, the test coefficient, degrees of freedom, exact p value, contingency structure, and respondent-level data were unavailable, preventing independent verification or estimation of association magnitude. Respondents perceived digital leadership and technology-enabled governance favorably, particularly for administrative communication and planning. Digital forecasting, data-informed decision-making, professional development, and monitoring of classroom technology use were relative improvement priorities.

1. Introduction

Digital transformation is an organizational-change process rather than a simple accumulation of devices. It alters workflows, decision structures, professional roles, and relations among institutions and their stakeholders (Hanelt et al., 2021). In education, digital technologies now support managerial, administrative, communicative, and pedagogical work, yet research on digital school leadership remains emerging, fragmented, and interdisciplinary (Wollscheid et al., 2025). Leadership therefore matters not only for acquiring technology but also for establishing a coherent vision, building staff capability, governing data, maintaining infrastructure, and aligning digital tools with learning priorities.

Educational leadership for technology-enabled learning spans strategic, organizational, and instructional levels. Arnold and Sangra (2018) found wide variation in how e-leadership is conceptualized and called for research linking educational technology with organizational change and leadership development. The ISTE Standards for Education Leaders similarly organize leadership responsibilities around equity and digital citizenship, visionary planning, educator empowerment, systems design, and continuous professional learning (International Society for Technology in Education [ISTE], 2018). These perspectives place technology integration within a socio-technical system: digital tools are productive only when leadership practices, policies, skills, and implementation conditions operate together.

Evidence from school settings reinforces this systems perspective. Research in Philippine public schools found that distributing tablet computers did not by itself ensure effective use; school-level management, implementation conditions, and local context influenced outcomes (Lumagbas et al., 2019). In Norwegian schools with one-to-one tablet coverage, responsibilities for infrastructure, privacy, digital competence, planning, and pedagogical use were unevenly distributed across school owners and leaders (Tomte & Smedsrud, 2023). Studies of technology leadership also associate leaders' practices and professional development with teachers' technology integration (Raman & Thannimalai, 2019), while digital transformational leadership has been linked to teacher commitment and perceived school effectiveness in remote-schooling contexts (Berkovich & Hassan, 2025). These findings support investigation of leadership and governance together while cautioning against treating access or positive perceptions as direct evidence of learning impact.

The Philippine policy environment gives school-level digital leadership a clear governance context. Republic Act No. 9155 locates basic-education governance across national and field levels and emphasizes accountability, transparency, feedback, and school

responsiveness to local needs. The Philippine Professional Standards for School Heads define expectations for strategic leadership, operations, teaching and learning, and professional development (Department of Education, 2020). The Department of Education Computerization Program provides a national framework for ICT resources and implementation (Department of Education, 2023), while the revised School-Based Management system strengthens participatory, learner-centered, and accountable governance (Department of Education, 2024). Together, these policies require school leaders to connect digital infrastructure with sound management and instruction.

Despite this policy direction, localized evidence remains necessary because schools differ in readiness, resources, staff capability, and organizational routines. The present study addresses this need in four public schools in District II, Division of Talisay City. It examines (1) selected respondent and resource characteristics; (2) perceived digital leadership in innovation, assessment, forecasting, management, and transfer; (3) perceived technology-enabled governance in administrative functions and instructional leadership efficacy; and (4) the reported relationship between digital leadership and governance integration. The study stated the null hypothesis that no significant relationship existed between digital leadership integration and technology integration in school governance.

2. Methods

2.1 Design and study setting

The study used a descriptive-correlational, cross-sectional survey design. Data were collected during School Year 2025-2026 in District II of the Division of Talisay City, Cebu, Philippines. The four participating schools were Mohon Elementary School, Vicenta A. Manreal Elementary School, Mohon (Divino Amore) National High School, and Pooc National High School.

2.2 Participants and sampling

The sample comprised 104 school personnel, allocated equally across the four schools (26 respondents per school). Eligibility required respondents to be teachers in one of the identified District II schools, have at least one year of teaching experience, and be willing to participate. The study described the selection method as random sampling but did not report the sampling frame, randomization procedure, invitations issued, response rate, exclusions, or nonresponse. Consequently, the intended random selection cannot be independently evaluated.

Table 1. Distribution of respondents by school

School	Respondent type	n	%
Mohon Elementary School	School personnel	26	25.0
Vicenta A. Manreal Elementary School	School personnel	26	25.0
Mohon (Divino Amore) National High School	School personnel	26	25.0
Pooc National High School	School personnel	26	25.0
Total		104	100.0

2.3 Instrument and measures

The questionnaire had three parts. Part I recorded age, gender, civil status, educational attainment, length of service, performance rating, relevant professional development, and technology resources available at school. Part II contained 25 statements intended to measure digital leadership across innovation, assessment, forecasting, management, and transfer. Part III contained 20 statements covering administrative functions and instructional leadership efficacy. All substantive items used a five-point scale: 5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, and 1 = strongly disagree. Means of 4.21-5.00 were interpreted as strongly agree, 3.41-4.20 as agree, 2.61-3.40 as neutral, 1.81-2.60 as disagree, and 1.00-1.80 as strongly disagree.

The study attributed Part II to a modified version of 'Validating a Measure of Teacher Technology Integration' and named Reinhart (2009). The identifiable conference paper is authored by Vannatta and Banister (2009), and its published constructs differ from the five technology-management domains used in the present questionnaire. Part III was attributed to work by Sara Dexter and Kenneth Leithwood, but complete instrument titles, item mappings, permissions, adaptation procedures, and bibliographic records were not supplied.

2.4 Data collection and ethical considerations

The researcher requested permission from the Schools Division Superintendent. Following approval, questionnaires were distributed personally, and respondents were given approximately 20-30 minutes to complete them. Completed data were submitted to a statistician, organized and interpreted with the research adviser, and incorporated into the thesis. Willingness to participate was stated as an eligibility condition.

2.5 Statistical analysis

Frequencies and percentages summarized respondent characteristics and available resources. Weighted means and standard deviations summarized scale responses. The methods adopted chi-square as the inferential procedure for testing the relationship between digital leadership and technology integration in school governance at the .05 significance level. However, the relationship table presented two scale means, a common test statistic of 10.43, and a critical value of 2.0176. It did not provide a contingency table, correlation coefficient, degrees of freedom, exact p value, expected cell counts, analytic sample size, or effect size. Because a critical value of 2.0176 is not interpretable as a conventional chi-square threshold without further specification.

3. Results

3.1 Respondent and school-resource characteristics

The respondent group was predominantly female (86 of 104; 82.7%). Graduate study was common: 58 respondents (55.8%) had master's units, 19 (18.3%) held a master's degree, 7 (6.7%) had doctoral units, and 3 (2.9%) held a doctorate. Seventy respondents (67.3%) had more than six years of service. Performance ratings were very satisfactory for 60 respondents (57.7%), outstanding for 42 (40.4%), and satisfactory for 2 (1.9%). Division-level professional development was the most frequently reported training level (f = 63). Age, civil-status, male-frequency, and training-total values contained unresolved inconsistencies and are not used for substantive interpretation.

Table 2. Selected respondent characteristics

Characteristic	Category	n	%
Gender	Female	86	82.7
Education	Master's units	58	55.8
Education	Master's degree	19	18.3
Education	Doctoral units or degree	10	9.6
Length of service	More than 6 years	70	67.3
Performance	Very satisfactory	60	57.7
Performance	Outstanding	42	40.4
Training level	Division	63	-

Televisions, computers or laptops, and printers were the most frequently reported school resources. Because the original resource percentages included several arithmetic discrepancies, Table 3 recalculates percentages from the stated frequencies using N = 104.

Table 3. Technology resources available in participating schools

Resource	Frequency	Percentage %
Television	100	96.0
Computers/laptops	98	92.0
Printer	96	92.0
Mobile phone	85	81.7
Microphone	56	53.8
Audio speaker	52	50.0
LCD projector	42	50.4

3.2 Digital leadership

The synthesis table in the study disclosed an overall digital-leadership mean of 4.00 (SD = 0.77), interpreted as agree. Innovation was the highest-rated domain (M = 4.11), followed by assessment (M = 4.02), management (M = 4.01), transfer (M = 3.95), and forecasting (M = 3.92). All domain means were within the agree range. The comparatively lower forecasting and transfer scores indicate relative rather than absolute gaps because their ratings remained positive.

Table 4. Digital-leadership domain scores

Domain	M	SD	Interpretation
Innovation	4.11	0.67	Agree
Assessment	4.02	0.81	Agree
Forecasting	3.92	0.81	Agree
Management	4.01	0.78	Agree
Transfer	3.95	0.78	Agree
Overall	4.00	0.77	Agree

3.3 Technology-enabled school governance

Technology-enabled governance was rated in the strongly agree range overall (M = 4.24, SD = 0.77). Administrative functions received a slightly higher mean (M = 4.26) than instructional leadership efficacy (M = 4.22). The difference of 0.04 scale points is descriptive and should not be interpreted as statistically tested. The result suggests that digital practices were perceived as somewhat more established in communication, documentation, planning, and operational systems than in the sustained pedagogical support required for classroom integration.

Table 5. Technology-enabled governance domain scores

Domain		M	SD	Interpretation
Administrative functions		4.26	0.72	Strongly agree
Instructional leadership efficacy		4.22	0.81	Strongly agree
Overall		4.24	0.77	Strongly agree

Item-level results identified both established practices and improvement priorities. Digital communication, support for planning and reporting, and encouragement of classroom technology integration were among the highest-rated practices. Data-informed administrative decision-making, formal technology policies, monitoring of classroom technology use, and professional development were lower, although still positively rated.

Table 6. Selected high-rated practices and relative improvement priorities

Area	Indicator	M	SD	Interpretation
Administrative	Use digital platforms to communicate with teachers, staff, and stakeholders	4.40	0.69	Strongly agree
Administrative	Support planning, implementation, and reporting	4.38	0.64	Strongly agree
Administrative	Provide clear policies and guidelines for technology use	4.13	0.80	Agree
Administrative	Use digital-system data to guide management decisions	4.05	0.73	Agree
Instructional	Encourage teachers to integrate digital technologies in instruction	4.38	0.69	Strongly agree
Instructional	Support teachers in improving digital competencies	4.31	0.76	Strongly agree
Instructional	Provide professional development on technology integration	4.18	0.77	Agree
Instructional	Monitor effective use of digital tools in teaching and learning	4.03	0.78	Agree

3.4 Relationship between digital leadership and governance integration

The relationship table reported a test statistic of 10.43 against a stated critical value of 2.0176 and directed rejection of the null hypothesis at alpha = .05. It interpreted the relationship as statistically significant. The associated component means were 4.24 (SD = 0.74) for the row labeled digital leadership integration and 4.00 (SD = 0.79) for technology integration in school governance. These component means are reversed relative to the synthesis tables in Sections 3.2 and 3.3, adding uncertainty about variable construction. Without a coefficient or underlying data, the direction and magnitude of association cannot be established from the supplied document.

Table 7. Significance test

Variables	Test statistic	Critical value	Decision	Interpretation
Digital leadership and technology-enabled governance	10.43	2.0176	Reject H0	Significant

4. Discussion

4.1 Principal findings

Respondents described a generally favorable digital-leadership environment across four public schools. Digital innovation was the highest-rated leadership domain, while forecasting and transfer were comparatively less developed. Governance ratings were stronger than leadership-domain ratings, particularly for administrative functions. At the item level, communication, planning support, and encouragement of technology use were prominent strengths. Formal policy, data-informed management, sustained professional development, and classroom monitoring emerged as the clearest improvement priorities. The study also shows a significant relationship between digital leadership and governance integration.

4.2 Digital leadership as organizational capability

The high innovation rating suggests that respondents experienced schools as receptive to e-learning programs, online platforms, and digital tools. Innovation alone, however, does not constitute digital transformation. Hanelt et al. (2021) characterize digital transformation as continuing organizational adaptation shaped by technology and embedded in wider ecosystems. In schools, this means that new tools must be supported by governance arrangements, capability development, data practices, infrastructure, and

feedback. The lower forecasting and transfer ratings are therefore consequential: they concern anticipation of technological change, evaluation of future requirements, formalized knowledge sharing, and institutionalization beyond isolated adoption.

The domain pattern is consistent with the broader digital-school-leadership literature, which has moved from a narrow focus on devices toward socio-technical questions of leadership, practices, value, and institutional context (Wollscheid et al., 2025). It also aligns with the ISTE leadership framework, in which visionary planning, scalable systems, privacy and security, partnerships, and connected professional learning are mutually reinforcing (ISTE, 2018). For the participating schools, innovation could be converted into durable capability by linking technology adoption to a multi-year roadmap, resource forecasting, privacy and cybersecurity responsibilities, succession planning, and mechanisms for sharing effective practices across the district.

4.3 Administrative strength and the instructional implementation gap

Administrative functions slightly exceeded instructional leadership efficacy. This pattern is plausible because communication, records, reporting, and planning can be digitized through standardized platforms, whereas instructional integration requires changes in pedagogy, assessment, teacher confidence, coaching, and classroom routines. The highest administrative item concerned digital communication, but the lowest concerned using system-generated data for decisions. Thus, digitizing information flow has progressed further than using digital evidence to improve management. OECD (2021) likewise emphasizes that data and advanced tools offer benefits only when human judgment, professional capability, and institutional design keep educators and leaders meaningfully involved.

On the instructional side, respondents strongly endorsed encouraging teachers and building digital competencies, yet they gave lower ratings to professional development, tool selection, innovative teaching strategies, and monitoring. This distinction matters because access and encouragement do not guarantee high-quality pedagogical use. In the Philippine tablet-program case, school-level management conditions shaped whether distributed devices were used effectively (Lumagbas et al., 2019). Likewise, research on technology leadership highlights the role of professional development in teachers' technology integration (Raman & Thannimalai, 2019). A defensible improvement strategy should therefore combine technical training with subject-specific lesson design, coaching, observation and feedback, assessment literacy, inclusive-design principles, and evidence of learner engagement.

4.4 Policy and practice implications

The findings identify four operational priorities. First, schools should formalize digital-governance policies covering platform approval, access control, privacy, cybersecurity, retention, and responsible use. Second, leaders should strengthen data literacy so that digital systems inform planning, resource allocation, learner support, and monitoring rather than merely accelerate reporting. Third, professional development should be continuous, job-embedded, and connected to classroom evidence. Fourth, the district should develop a community of practice that allows schools to share templates, troubleshoot implementation, review emerging technologies, and preserve institutional knowledge.

These priorities are consistent with Philippine shared-governance and professional-standard frameworks. Republic Act No. 9155 emphasizes accountability, transparency, and effective communication across governance levels. The PPSSH locates data use, strategic planning, school operations, teaching and learning, and development of self and others within school-head practice (Department of Education, 2020). The Computerization Program and revised School-Based Management policy provide complementary resource and governance contexts (Department of Education, 2023, 2024). Technology initiatives should therefore be evaluated not only by equipment availability or platform use but also by secure systems, staff learning, instructional quality, equitable access, and evidence of improvement.

5. Conclusion

School personnel in four public schools in Talisay City reported positive digital leadership and strong technology-enabled governance. Innovation, administrative communication, and planning support were prominent strengths, whereas forecasting, knowledge transfer, data-informed decision-making, professional development, and monitoring were relative development needs. The study reported a significant relationship between digital leadership and governance integration, but incomplete statistical details mean that its direction and magnitude remain unverified. The strongest defensible conclusion is that favorable digital-leadership and governance perceptions co-occurred in this setting. A sustainable response should integrate policy, secure infrastructure, data literacy, instructional coaching, monitoring, and cross-school professional learning while future research uses validated instruments and transparent respondent-level analyses.

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