

**The principal as technology leaders in public elementary schools:
The Legislative District V, Isabela experience**

JunJun G. Ringor¹

Northeastern College
Santiago City, Isabela, Philippines
Email: junjun.ringor@gmail.com

ABSTRACT

This study examined the roles of principals as technology leaders in public elementary schools in Legislative District V, Isabela, using a descriptive-normative design. Participants included 49 school heads and 125 teachers selected through purposive sampling. Data were gathered via questionnaires, interviews, and documentary analysis, and analyzed using frequencies, weighted means, and t-tests. Results revealed that principals' technology leadership roles were fully realized (WM = 4.58-4.64), leadership proficiencies were fully manifested (WM = 4.51-4.56), and technology integration standards were fully implemented across all domains (grand WM = 4.30 for school heads; 4.53 for teachers). Both groups strongly agreed on principals' professional development needs (grand WM = 4.78 and 4.76). Significant perceptual differences existed between school heads and teachers on leadership practices, but not on professional development priorities. The findings show the importance of sustained, targeted professional development to strengthen instructional leadership and support continuous digital transformation in public elementary schools.

Keywords: Technology leadership, school principals, technology integration standards, professional development needs, public elementary schools

Date Submitted: January 6, 2026

Date Accepted: January 19, 2026

Date Published: February 4, 2026

INTRODUCTION

The global education system is increasingly embracing the principles of the Fourth Industrial Revolution, marked by rapid advances in digitalization, robotics, scientific innovation, and automation. Despite these technological transformations, human-centered competencies remain essential, underscoring the continuing importance of human capital in the emerging industrial era (Thannimalai & Raman, 2019).

Schools, as primary institutions for learning and leadership development, are now confronted with the challenge of fully integrating technological advancements into educational practice. This challenge requires principals and teachers to adopt open-minded attitudes toward change and innovation. They must prepare themselves to integrate technology effectively in school settings by acquiring up-to-date technological skills. Principals are expected to serve as

DOI: <http://doi.org/10.69651/PIJHSS0501784>

Recommended citation:

Ringor, J. G. (2026). The principal as technology leaders in public elementary schools: The Legislative District V, Isabela experience. *Pantao (The International Journal of the Humanities and Social Sciences)* 5 (1), 8725-8733. <http://doi.org/10.69651/PIJHSS0501784>

technology leaders, while teachers act as facilitators of learning, together providing students with the competencies required for 21st-century education (Roblyer & Doering, 2014).

A principal's responsibility extends to encouraging teachers to adopt technology in instruction and to enhance their proficiency in its use to meet the demands of the digital economy and workforce. Given the rapid pace of technological development, principals must continuously adapt and apply emerging innovations. Consequently, they are encouraged to strengthen their technological leadership to respond to contemporary educational challenges (Hacifazlioglu et al., 2011). These expanded roles include identifying new technologies, establishing computer laboratories, preparing teachers to integrate ICT across the curriculum, and exercising leadership in technology integration. As technological leaders, principals must be familiar with educational technology goals and standards, understand the benefits of technology integration, and develop professional development programs for teachers (Beytekin, 2014).

A critical component of technology leadership involves motivating teachers to learn, utilize, and implement technology in their instructional practices (Speedy & Brown, 2014). School leadership increasingly centers on the effective management of ICT for teaching and learning. ICT leadership is vital in supporting teachers' innovation and instructional improvement (Geir, 2013). Thus, school leaders function both as agents of change and as experts in technology leadership (Januszewski & Molenda, 2012).

Technological leadership differs from traditional leadership models in that it emphasizes the development, guidance, management, and application of technology to improve organizational performance rather than focusing solely on leaders' traits or behaviors (Chin, 2010). This function-oriented leadership underscores the need for principals to model effective technology practices and guide their institutions toward meaningful technological integration (Chang & Hsu, 2008). However, technological competence is not limited to school heads; teachers likewise must possess the skills necessary to implement technology effectively.

Teachers, as frontliners of the education sector, are expected to embrace technology in teaching. Studies have shown that technology integration promotes collaborative learning and enhances instructional effectiveness (Basitere & Ndeto-Ivala, 2017). Similarly, Hero (2020) found that teachers demonstrate proficiency in classroom technology integration and regard it as a form of pedagogical innovation.

Despite these positive findings, challenges persist. Apsorn, Sisan, and Tungkunan (2019) reported that many school administrators lack readiness in information technology, including limited knowledge, experience, and expertise in creating innovative digital learning materials. This deficiency in ICT leadership significantly affects school administration and educational management. Furthermore, Unal et al. (2015) observed no significant differences in technology leadership self-efficacy across school levels, suggesting systemic concerns. Teachers also face difficulties, particularly in technological content knowledge (Apau, 2017).

Within the Philippine educational context, school leaders, including principals and teachers alike, are responding to the demands of Industry 4.0 by transforming instructional and administrative practices. Technological leadership has become central to improving teachers' proficiency and strengthening the overall education system. In this light, the present study seeks to assess and describe the roles of principals as technology leaders in public elementary schools.

This study is anchored on Collaborative Leadership Theory. Collaborative leadership refers to a management approach in which leadership teams work across sectors to make shared decisions that sustain organizational effectiveness. This model departs from traditional top-down leadership by emphasizing collective participation and transparency in decision-making (DiFranza, 2019).

In an era marked by constrained educational resources, exacerbated by pandemic-related budget reductions, educators, policymakers, and community stakeholders are increasingly aware of the need to maximize outcomes through collaboration (Blank et al., 2010). Educational institutions, social services, and community organizations often operate in isolated silos, despite serving the same learners and families. Such fragmentation limits the effectiveness of interventions and underscores the importance of cross-sector collaboration.

Collaborative leadership promotes inclusive and supportive practices that engage all stakeholders in addressing shared concerns. Research indicates that strong collaborative leadership contributes to higher academic achievement and more productive school environments. This approach requires participants to engage openly and set aside individual ego for collective problem-solving (Sergiovanni, 1994).

Schools today face complex challenges characterized by uncertainty, ambiguity, and increasing demands for innovation. Educational leaders who adopt collaborative leadership models involving teachers, parents, students, and community partners are better positioned to respond to these challenges (Hallinger, 1992). However, despite policy emphasis on collaboration, limited research has examined the leadership competencies required to maximize such partnerships (Coleman, 2011).

Emerging leadership models emphasize collective and distributed leadership rather than individual authority (Fletcher, 2004). Yet leadership development literature continues to prioritize individual skills over collaborative capacities (DeRue & Wellman, 2009). Johansen (2009) argues that leaders must act as positive change agents amid uncertainty, continuously learning and applying new leadership strategies.

In this study, collaborative leadership provides a theoretical lens for understanding how principals, teachers, and stakeholders work together to promote technology integration and instructional improvement. Principals' effectiveness as technology leaders is viewed as a collective endeavor, dependent on shared vision, professional collaboration, and sustained organizational learning.

Statement of the problem

This study aimed to assess the roles of principals as technology leaders in public elementary schools in Legislative District V, Division of Isabela, during School Year 2021-2022. Specifically, it sought to answer the following questions:

1. What is the profile of the respondents in terms of age, gender, civil status, highest educational attainment, present position, latest performance rating, length of service, and level of in-service training attended in SBM?
2. To what extent are the different roles of principals as technology leaders realized?
3. How do principals manifest their technology leadership proficiencies?
4. What is the extent of implementation of technology integration standards for school administrators in terms of leadership and vision, teaching and learning, productivity and professional practice, management and operations, assessment and evaluation, and social, legal, and ethical issues?
5. What is the extent of agreement regarding the professional development needs of principals as technology leaders in terms of perceptions of theory, concepts of technology in school, skills acquired, and skills needed?
6. Is there a significant difference between the perceptions of school heads and teachers regarding the roles of principals as technology leaders in public elementary schools in Legislative District V, Isabela?

METHODOLOGY

Research design

This study aimed to assess the perceptions of school heads and teachers regarding the significant roles of principals as technology leaders in public elementary schools in Legislative District V, Division of Isabela, during School Year 2021-2022. The researcher adopted the descriptive-normative research method, which was deemed appropriate for the nature and objectives of the study.

According to Good and Scates (2001), the descriptive method is suitable for determining the current conditions of units, groups, organizations, and programs. The term normative is applied because surveys are commonly conducted to ascertain typical or prevailing practices. These methods are used to organize, analyze, interpret, and report the present status of a group. Similarly, Van Dalen and Meyer (1999) emphasized that descriptive research is not limited to routine fact gathering; rather, it also seeks to predict and identify relationships among variables. This method examines problematic situations, defines problems, states hypotheses, selects appropriate respondents and materials, establishes categories for classifying data, and applies suitable techniques for analysis. It further involves objective observation and the clear presentation, analysis, and interpretation of findings. Best (1999) likewise stated that descriptive research describes and interprets phenomena that are subject to investigation.

Whitney (1999) explained that descriptive-normative research focuses on determining prevailing conditions and seeks to answer questions regarding existing realities. This method combines two closely related aspects: survey, which refers to the collection of data on current conditions, and normative, which involves reporting and interpreting the present status of social institutions or groups. Its purpose is to generate classified, generalized, and interpreted data that can guide future practice.

Locale of the study

The study was conducted in public elementary schools in Legislative District V, Division of Isabela. Historically, Isabela functioned as a lone legislative district until 1972 and later underwent several redistricting processes. In September 2018, Republic Act No. 11080 expanded the province's legislative districts from four to six.

Legislative District V presently consists of eight municipalities: Aurora, Burgos, Luna, Mallig, Quezon, Quirino, Roxas, and San Manuel. These municipalities served as the research sites for this study.

Respondents of the study

Purposive sampling was employed to select school heads and teachers from public elementary schools within Legislative District V. A total of 49 school heads and 125 teachers participated in the study, representing the different districts in the area.

Data gathering instruments

Three instruments were used in gathering data: a questionnaire checklist, documentary analysis, and unstructured interviews. The primary instrument was the questionnaire, while documentary analysis and interviews served as supplementary tools. The questionnaire was developed based on professional books, periodicals, and unpublished materials such as theses and dissertations, and covered the profile of respondents, the extent of realization of principals'

roles as technology leaders, the extent of manifestation of technology leadership proficiencies, the extent of implementation of technology integration standards for school administrators, and the extent of agreement on the professional development needs of principals as technology leaders. The questionnaire underwent pilot testing among selected school heads and teachers, whose feedback, together with review by the researcher's adviser and the Graduate School Dean, was incorporated into the final version before administration. Unstructured interviews were subsequently conducted to validate selected responses from the questionnaire, and relevant records and inventories from district offices were reviewed to verify and support questionnaire data.

Data gathering procedures

Prior to data collection, permission was secured from the Office of the Schools Division Superintendent through proper channels, and approval was likewise obtained from school administrators. The questionnaire was revised based on expert feedback, reproduced, and personally administered by the researcher. Completed questionnaires were retrieved directly from respondents, and the collected data were tallied and organized to facilitate analysis and interpretation.

Statistical treatment of data

Frequencies and percentages were used to describe the profile of respondents. Weighted means were applied to determine respondents' perceptions regarding principals' roles as technology leaders, their leadership proficiencies, implementation of technology standards, and professional development needs. An independent t-test was employed to determine whether a significant difference existed between the perceptions of school heads and teachers regarding principals' roles as technology leaders in public elementary schools in Legislative District V, Isabela.

RESULTS AND DISCUSSION

This section presents the findings of the study based on data gathered from 49 school heads and 125 teachers in public elementary schools in Legislative District V, Division of Isabela, during School Year 2021-2022. A descriptive-normative research design was employed, with data analyzed using frequencies, percentages, weighted means, and independent t-tests. Results are interpreted in direct relation to the research objectives, covering respondents' profiles, the realization of principals' technology leadership roles, manifestation of leadership proficiencies, implementation of technology integration standards, professional development needs, and perceptual differences between groups.

Profile of the respondents

The respondents comprised 49 school heads and 125 teachers, with most belonging to the 46-50 age group (36.73% of school heads; 20.80% of teachers), indicating a generally mature workforce. Females dominated both groups (61.22% of school heads; 85.60% of teachers), and the majority were married (89.80% and 76.80%, respectively). Most school heads had MAEd units (38.78%), while many teachers were MAEd graduates (23.20%). Principal II (34.69%) and Teacher III (65.60%) were the most common positions. All school heads and 74.40% of teachers earned outstanding performance ratings, reflecting strong professional competence. These findings suggest a stable, experienced teaching force capable

of supporting technology-driven initiatives. However, continuous professional development remains essential to sustain innovation and strengthen instructional leadership.

Extent of realization of principals' roles as technology leaders

School heads rated the realization of principals' technology leadership roles as Fully Realized, with an overall weighted mean of 4.58. The highest-rated role was supporting technology use in school (WM = 4.71), followed by providing professional development (WM = 4.67) and communicating the importance of technology to stakeholders (WM = 4.61). Teachers likewise reported Fully Realized roles, with a higher overall weighted mean of 4.64. Their highest ratings were for supporting technology use (WM = 4.71), engaging in technology-focused professional development (WM = 4.70), and providing staff training (WM = 4.68). These results indicate strong alignment between school heads' and teachers' perceptions of principals' technology leadership.

Extent of manifestation of technology leadership proficiencies

School heads rated their technology leadership proficiencies as Fully Manifested, with an overall weighted mean of 4.51. The highest-rated areas (WM = 4.53) were inspiring a shared technology vision, applying technology to professional practice, and ensuring technology-supported learning systems. Teachers likewise perceived these proficiencies as Fully Manifested, reporting a higher overall weighted mean of 4.56. The strongest proficiencies were inspiring a shared vision and applying technology to professional practice (both WM = 4.59), followed by modeling ethical technology use (WM = 4.58). These findings reflect strong and consistent perceptions of effective technology leadership among school heads.

Extent of implementation of technology integration standards

Results indicate that technology integration standards among school administrators were Fully Implemented across all domains. School heads reported a grand weighted mean of 4.30, while teachers registered a higher overall mean of 4.53. Among school heads, Productivity and Professional Practices ranked highest (WM = 4.39), followed by Social, Legal, and Ethical Issues (WM = 4.35) and Assessment and Evaluation (WM = 4.34). Teachers rated Productivity and Professional Practices and Assessment and Evaluation highest (both WM = 4.55), with Teaching and Learning and Support, Management, and Operations close behind (WM = 4.53 each). Leadership and Vision also received strong ratings (WM = 4.22 to 4.48). Overall, the consistently high ratings from both groups suggest robust institutional capacity for technology integration. These findings imply that school administrators demonstrate effective leadership in embedding technology across instructional, managerial, and ethical domains, providing a solid foundation for sustained digital transformation in public elementary schools.

Professional development needs of principals as technology leaders

Findings reveal a strong consensus between school heads and teachers regarding principals' professional development needs in technology leadership. Both groups reported Strong Agreement, with grand weighted means of 4.78 for school heads and 4.76 for teachers. For concepts of technology in schools, both groups registered the highest mean (WM = 4.78), emphasizing principals' ability to recognize effective classroom technology use (WM = 4.82). In terms of skills needed, the highest ratings were given to knowledge of digital equipment (WM = 4.88 for school heads; WM = 4.80 for teachers) and data-driven decision-making

competencies (approximately 4.78 for both groups). Strong agreement was likewise confirmed across all domains, including perception of theories, concepts of technology, and skills needed. Overall, the consistently high ratings indicate a shared recognition of the critical role of continuous professional development in strengthening principals' technological competence and underscore the need for sustained, targeted training programs to enhance instructional leadership and organizational effectiveness in technology-driven school environments.

Differences in perceptions of school heads and teachers

The t-test results revealed significant differences between school heads' and teachers' perceptions on three domains: extent of realization of principals' technology leadership roles ($p = .017$), manifestation of technology leadership proficiencies ($p = .001$), and implementation of technology integration standards ($p = .000$). Consequently, the null hypothesis was rejected for these variables. However, no significant difference was found in the extent of agreement on professional development needs ($p = .410$), leading to acceptance of the null hypothesis. These findings indicate perceptual gaps between school heads and teachers regarding current technology leadership practices, while both groups share a common understanding of principals' professional development needs, highlighting unified priorities for capacity-building initiatives.

CONCLUSION

This study established that school heads and teachers in public elementary schools in Legislative District V, Isabela generally possess mature professional profiles, characterized by strong educational preparation, extensive teaching experience, and consistently outstanding performance ratings. These characteristics provide a favorable foundation for technology-driven school leadership and instructional innovation.

Findings further revealed that principals' roles as technology leaders are fully realized, their technology leadership proficiencies are fully manifested, and technology integration standards are fully implemented across key domains, including leadership and vision, teaching and learning, productivity and professional practice, management and operations, assessment and evaluation, and social, legal, and ethical issues. Both school heads and teachers also expressed strong agreement on principals' professional development needs, underscoring the importance of continuous capacity building in technological leadership.

However, significant differences were observed between school heads' and teachers' perceptions regarding the realization of leadership roles, manifestation of proficiencies, and implementation of standards, suggesting the need for more aligned communication and shared understanding of leadership practices. In contrast, both groups demonstrated consensus on professional development priorities, highlighting a common recognition of the competencies required for effective technology leadership.

Given these findings, school heads are encouraged to sustain and strengthen their technology leadership practices through continuous professional learning, while teachers should be supported through targeted training programs that enhance technology integration in instruction. Education authorities may consider institutionalizing regular, needs-based professional development initiatives focused on instructional technology, data-informed leadership, and emerging digital tools. Future studies may expand the scope to include private schools and examine the direct impact of principals' technology leadership on learners' academic performance to provide deeper insights into educational outcomes.

REFERENCES

- Apson, A., Sisan, B., & Tungkunan, P. (2019). Information and communication technology leadership of school leadership in Thailand. *International Journal of Instruction*, 12(2), 639-650. <https://doi.org/10.29333/ijii.12240a>
- Basitere, M., & Ndeto-Ivala, E. (2017). An evaluation of the effectiveness of the use of multimedia and Wiley Plus web-based homework system in enhancing learning in the chemical engineering extended curriculum program physics course. *Electronic Journal of e-Learning*, 15(2), 156-173.
- Best, J. W. (1999). *Research in education*. Prentice Hall.
- Beytekin, O. F. (2014). High school administrators' perception of their technology leadership preparedness. *Educational Research and Reviews*, 9(14), 441-446.
- Blank, M., Jacobson, R., Melaville, A., & Pearson, S. (2010). Financing community schools: Leveraging resources to support student success. Coalition for Community Schools, Institute for Educational Leadership. <http://www.communityschools.org/assets/1/AssetManager/finance-paper.pdf>
- Chang, I.-H., Chin, J. M., & Hsu, C.-M. (2008). Teachers' perceptions of the dimensions and implementations of technology leadership of principals in Taiwanese elementary schools. *Educational Technology & Society*, 11(4), 229-245.
- Chin, J. M. (2010). *The theory and application of educational leadership*. Wunan.
- Coleman, A. (2011). Towards a blended model of leadership for school-based collaborations. *Educational Management Administration & Leadership*, 39(3), 296-316.
- DeRue, D. S., & Wellman, N. (2009). Developing leaders via experience: The role of developmental challenge, learning orientation, and feedback. *Journal of Applied Psychology*, 94, 859-875.
- DiFranza, A. (2019). Collaborative leadership: What it is & why it's important. Northeastern University. <https://www.northeastern.edu/graduate/blog/collaborative-leadership/>
- Fletcher, J. (2004). The paradox of post-heroic leadership: An essay on gender, power, and transformational change. *The Leadership Quarterly*, 15(5), 647-661.
- Geir, O. (2013). School leadership for ICT and teachers' use of digital tools. *Nordic Journal of Digital Literacy*, 8, 107-125.
- Good, C. V., & Scates, D. (2001). *Methods of research*. Appleton-Century-Crofts.
- Hacifazlioglu, O., Karadeniz, S., & Dalgic, G. (2011). School administrators' perceptions of technology leadership: An example for metaphor analysis. *Journal of Educational Sciences Research*, 1(1), 97-121.
- Hallinger, P. (1992). The evolving role of American principals: From managerial to instructional to transformational leaders. *Journal of Educational Administration*, 30(3), 35-48.

- Hero, J. L. (2020). Exploring the principal's technology leadership: Its influence on teachers' technological proficiency (Master's thesis). Bulacan Polytechnic College.
- Januszewski, A., & Molenda, M. (2012). Definition. In A. Januszewski & M. Molenda (Eds.), *Educational technology: A definition with commentary* (pp. 195-211). Lawrence Erlbaum Associates.
- Johansen, B. (2009). *Leaders make the future: Ten new leadership skills for an uncertain world*. Berrett-Koehler.
- Roblyer, M. D., & Doering, A. H. (2014). *Integrating educational technology into teaching* (6th ed.). Pearson.
- Sergiovanni, T. J. (1994). *Building communities in schools*. Jossey-Bass.
- Speedy, J., & Brown, M. (2014). *Technology leadership in education*. http://imet.csus.edu/imet1/mica/AR_Project_Final.pdf
- Thannimalai, R., & Raman, R. (2019). *Principals' technology leadership and teachers' technology integration in the 21st century classroom* (Doctoral dissertation). Universiti Utara Malaysia.
- Unal, E., Uzun, A. M., & Karatas, S. (2015). An examination of school administrators' technology leadership self-efficacy. *Croatian Journal of Education*, 17(1), 197-215.
- Van Dalen, D. B., & Meyer, M. (1999). *Understanding educational research: An introduction*. McGraw-Hill.
- Whitney, F. L. (1999). *Elements of research*. Prentice Hall.