

# Technology leadership practices and reflective teaching approaches of elementary school teachers in Dupax del Norte II District

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## **Abstract**

This study examined the technology leadership practices and reflective teaching approaches of public elementary school teachers in the Dupax del Norte II District. Specifically, it focused on four dimensions of technology leadership—technological vision, technology competence, technology-related professional development, and technology integration—and five dimensions of reflective teaching: self-assessment and pedagogical awareness, learner-centered reflection, use of feedback and evidence, adaptability and instructional improvement, and professional growth and lifelong learning. The respondents consisted of 88 permanent teachers selected through Slovin’s formula and stratified sampling during the school year 2025–2026. Data were gathered using a validated researcher-made questionnaire and analyzed using descriptive statistics and Pearson product–moment correlation at a 0.05 level of significance. Findings revealed that technology leadership practices were perceived as high ( $\bar{x} = 3.20$ ), with Technology Vision obtaining the highest mean. Reflective teaching approaches were also rated high ( $\bar{x} = 3.34$ ), particularly in the use of feedback and evidence. A strong and significant relationship was found between technology leadership and reflective teaching ( $r = 0.761$ ,  $p = 0.001$ ), indicating that effective technology leadership supports reflective practice, instructional improvement, and professional growth. Based on these results, a training design was developed focusing on addressing identified gaps through Learning Action Cell–based modules that strengthen leadership capacity, reflective practice, and instructional effectiveness. The study concludes that strong technology leadership fosters a reflective teaching culture that enhances teaching quality and student learning outcomes.

**Keywords:** management intervention, reflective teaching, technology leadership

## **Technology leadership practices and reflective teaching approaches of elementary school teachers in Dupax del Norte II District**

### **1. Introduction**

As education continues to evolve in the 21st century, the integration of technology particularly artificial intelligence into teaching and learning has significantly redefined the role of teachers. Teachers are no longer mere transmitters of knowledge but are expected to lead, model, and innovate through technology-based approaches that cater to diverse learner needs. In rural and geographically isolated districts such as Dupax del Norte II, these expectations are both a challenge and an opportunity. The effective use of technology is not only a pedagogical tool but a marker of professional leadership. As such, examining how teachers demonstrate technology leadership practices is essential for understanding how education systems can adapt and thrive in the digital age, especially in underserved contexts.

More importantly, the way teachers reflect on and improve their teaching practices is just as critical as their technological competence. Reflective teaching enables educators to examine their decisions, beliefs, and instructional methods with the goal of enhancing student learning outcomes. In the Dupax del Norte II District—where terrain, connectivity, and access to digital infrastructure vary widely—teachers' ability to lead through technology and to engage in meaningful reflection may shape the overall effectiveness of classroom instruction. This research, therefore, explores the relationship between these two professional attributes: technology leadership and reflective teaching, within the context of the Department of Education–Dupax del Norte II District.

The concept of technology leadership among teachers has expanded from merely using devices in the classroom to modeling best practices, facilitating digital learning, and influencing school-wide innovation. According to Lahera et al. (2020), technology leadership is the strategic application of digital tools and resources to lead pedagogical transformation. Teachers as technology leaders foster a culture of innovation and collaboration by demonstrating how technology can be harnessed to improve instruction, assessment, and student engagement. This dimension of leadership is especially crucial in remote and resource-limited areas, where visionary teachers act as agents of change, bridging gaps in access and opportunity.

Recent studies emphasize that teachers who display strong technology leadership not only adopt digital tools but also encourage reflective practices among peers and learners. As noted by Tseng and Yeh (2019), technology leadership significantly influences how teachers evaluate their instruction and adapt it to meet learner needs. Reflective teaching, on the other hand, requires educators to critically assess the effectiveness of their methods, often informed by student performance, feedback, and classroom experiences. Teachers who lead in technology are more likely to engage in data-driven reflection, using tools such as learning analytics, digital assessments, and peer collaboration platforms to inform their decisions. Furthermore, reflective teaching is a powerful mechanism for continuous professional growth. Farrell (2019) asserts that teachers who consistently reflect on their classroom practices demonstrate higher levels of pedagogical awareness and adaptability. Reflection leads to improved instructional strategies, responsiveness to students' diverse needs, and a deeper understanding of the teaching-learning process. When teachers are supported by strong technology leadership, they gain access to digital environments that enhance and deepen their reflections—be it through video lesson reviews, e-portfolios, or peer feedback systems.

In the context of the Dupax del Norte II District, where teaching conditions may be influenced by topographical, infrastructural, and technological limitations, understanding how technology leadership intersects with reflective practice can offer valuable insights. It may reveal how local educators adapt to challenges through innovation and introspection. As Ponce et al. (2022) suggest, in rural educational settings, teachers who exhibit both technology leadership and reflective practices tend to be more resilient and responsive, despite constraints.

Their ability to integrate technology meaningfully and reflectively can redefine learning experiences and outcomes for students in marginalized communities.

This study is timely and significant as it addresses a pressing need to develop a more technology-forward and reflection-driven teaching force in basic education, especially in areas like Dupax del Norte II where progress depends heavily on teacher initiative. By exploring the relationship between technology leadership practices and reflective teaching, the research aims to inform policy, professional development programs, and school-based innovations that empower educators. In doing so, it aligns with the Department of Education's thrust toward enhancing 21st-century teaching competencies and promoting inclusive, technology-enabled, and reflective education.

In today's digital education environment, the role of teachers extends beyond content delivery. They are now expected to lead technological integration while constantly evaluating and improving their teaching strategies. This dual responsibility is embodied in two key professional competencies: technology leadership and reflective teaching practices. Technology leadership involves the ability of teachers to model effective technology use, guide instructional innovation, and support digital transformation in schools. Reflective teaching, on the other hand, is the process of thoughtfully analyzing one's teaching to improve instruction and student outcomes. These two areas are increasingly interconnected in 21st-century education.

Technology leadership among teachers is multidimensional. According to Lahera et al. (2020), it includes establishing a technological vision, fostering technology competence, promoting professional development in technology use, and ensuring the integration of digital tools into school practices. Teachers who demonstrate these dimensions serve as role models, helping their peers adopt technology more confidently while contributing to the school's digital transformation. In underserved or rural settings, such leadership is even more critical as teachers often compensate for limited infrastructure by being resourceful and innovative in their use of technology (Ponce et al., 2022). Their leadership ensures that learners have access to engaging, relevant, and future-ready education.

Meanwhile, reflective teaching practices are also composed of distinct dimensions. Farrell (2019) categorizes these as self-assessment, learner-centered reflection, use of evidence and feedback, instructional adaptability, and professional growth. These dimensions emphasize a teacher's capacity to reflect critically on their instructional approaches, adapt based on student needs and performance data, and grow professionally through deliberate reflection. Teachers who engage in reflective practice tend to be more effective, as they continuously revise their methods in pursuit of improved learning outcomes (Larrivee, 2020).

The convergence of these two competencies—technology leadership and reflective teaching—is particularly significant in the context of public schools in geographically isolated areas like the Dupax del Norte II District. Despite policy mandates and national ICT frameworks, schools in rural settings often lack sufficient infrastructure, training, and support. Yet, many teachers in these schools manage to implement technology and remain pedagogically effective. This suggests that their personal technology leadership and capacity for reflection may be compensating for systemic gaps. However, few empirical studies have explored how these two constructs are related in such contexts. Most existing literature focuses on school principals or urban settings, leaving a gap in understanding the technology leadership roles played by classroom teachers in rural environments (Tseng & Yeh, 2019).

This study is important because it addresses that gap. By examining the relationship between technology leadership practices and reflective teaching among teachers in the Department of Education–Dupax del Norte II District, the research seeks to offer insights into how teachers navigate challenges and pursue innovation in remote contexts. The findings may inform school-based professional development programs, guide education leaders in rural districts, and contribute to the formulation of responsive policies that empower teachers as both technology leaders and reflective practitioners.

This research aligns closely with various global, national, and institutional research frameworks that aim to

elevate the quality and effectiveness of education. At the international level, the study supports the United Nations' Sustainable Development Goal (SDG) 4, which aspires to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." Specifically, SDG Target 4.c emphasizes the need to "substantially increase the supply of qualified teachers, including through international cooperation for teacher training." By examining technology leadership and reflective teaching practices, this research contributes to strengthening teacher capacity, especially in underserved and geographically isolated areas such as the Dupax del Norte II District.

Furthermore, the study resonates with the Philippine National Research Agenda on Teacher Education, spearheaded by the Commission on Higher Education (CHED) and the Teacher Education Council (TEC). The agenda underscores the significance of research focused on teacher quality, professional development, instructional innovation, and digital pedagogy. This research addresses two core areas: (1) how teachers exhibit leadership in technology integration, and (2) how reflective practices enhance their instructional effectiveness. Both dimensions are central to elevating the standards of teaching in the country and promoting adaptive teaching models in response to 21st-century learning demands.

Aligned with the Department of Education (DepEd) Research Agenda, this study addresses the priority area of Teaching and Learning, with subthemes on teacher professional development and technology integration in instruction. DepEd recognizes that effective teaching is anchored not just on content mastery but also on pedagogical adaptability, critical reflection, and innovation—especially in light of the Basic Education Learning Continuity Plan (BE-LCP). The study also contributes to the agenda's goal of evidence-informed decision-making by providing research-based insights into how rural teachers lead technological transformation while engaging in reflective practices.

Locally, this study supports the NVSU Institutional Research Agenda, particularly in the thematic area of Education and Teacher Development. As a higher education institution committed to regional development and educational innovation, NVSU encourages research that strengthens the competencies of basic education teachers, especially in ICT-based instruction and professional growth. This study, set within the Dupax del Norte II District—an area within the university's service reach—provides localized evidence that can inform curriculum design, extension programs, and policy advocacy.

Within the College of Teacher Education (CTE) of NVSU, the research aligns with key thrusts such as Enhancing Teacher Quality, Instructional Technology Integration, and Research-Informed Reflective Practice. The CTE prioritizes the development of teachers who are not only competent but also adaptive, reflective, and digitally empowered. This study directly supports the CTE's commitment to preparing pre-service and in-service teachers to meet the evolving demands of education through leadership and reflection. It is noted by the researcher that this research is not only academically relevant but also socially and institutionally responsive. It answers the call of multiple educational stakeholders to produce teachers who lead with technology and reflect with purpose, thereby contributing to the broader mission of quality and transformative education. The main aim of this study was to examine the technology leadership practices and reflective teaching approaches of public elementary school teachers in Dupax del Norte II District. Specifically, it sought to answer the following questions.

1. What is the perception of the respondents of their technology leadership practices along the dimension of technological vision, technology competence, technology professional development, and technology integration?
2. What is the perception of the respondents of their reflective teaching approaches along the dimensions of self-assessment and pedagogical awareness, learner-centered reflection, use of feedback and evidence, adaptability and instructional improvement, and professional growth and lifelong learning?
3. Is there a significant relationship between the dimensions of technology leadership practices and reflective teaching approaches of the respondents?

4. Based on the significant findings of the study, what educational management intervention could be crafted by the researcher to sustain/enhance their technology leadership practices and reflective teaching approaches?

## 2. Related Literature

This study is anchored in two foundational theories that support its conceptual and analytical framework. The first is Transformational Leadership Theory, originally introduced by James MacGregor Burns and later expanded by Bass and Riggio (2006). This theory is highly relevant to technology leadership, as it emphasizes the importance of inspiring a shared vision (e.g., technological vision), developing staff capacity (technology competence and professional development), and fostering innovation (technology integration). Transformational leaders are characterized by their ability to motivate, empower, and guide others through meaningful change—core competencies essential for teacher-leaders and school administrators implementing technology in education.

The second theoretical anchor is Reflective Practice Theory, developed by Donald Schön (1983). Schön's framework distinguishes between "reflection-in-action," which occurs during teaching, and "reflection-on-action," which takes place after an instructional experience. These reflective processes are crucial for educators aiming to enhance their practice. The theory underpins key dimensions of reflective teaching such as self-assessment, pedagogical awareness, responsiveness to feedback and evidence, instructional adaptability, and commitment to continuous professional learning. As such, it provides a strong foundation for understanding how educators critically examine and improve their instructional approaches over time.

The study titled "Technology Leadership Practices and Reflective Teaching Approaches of Elementary School Teachers in Dupax del Norte II District" as mentioned earlier is anchored in two significant theoretical frameworks: Transformational Leadership Theory and Reflective Practice Theory. These theories provide a strong conceptual foundation for understanding the dynamic interplay between teachers' leadership in technology use and their reflective teaching behaviors in the classroom.

Based on the analysis of the researcher, Transformational Leadership Theory, is appropriate for understanding the technology leadership practices of teachers. This theory highlights key leadership dimensions—such as idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration—that align closely with how educators implement and lead technological innovation. In the context of elementary education, teachers are increasingly called upon to not only integrate technology in teaching but also to act as role models and change agents in promoting digital literacy and 21st-century learning. The dimensions of transformational leadership resonate well with the constructs of technological vision, competence, professional development, and technology integration being examined in this study. By using this theory, the research situates technology leadership not merely as a technical skill but as a transformative process that inspires others, fosters collaboration, and drives innovation in educational settings. Teachers who embody transformational leadership traits are better positioned to influence their peers, engage students effectively, and contribute to a culture of continuous improvement in technology-enhanced teaching.

Moreover, Reflective Practice Theory is highly relevant to the exploration of reflective teaching approaches. Schön's distinction between "reflection-in-action" (reflection during teaching) and "reflection-on-action" (reflection after teaching) provides a comprehensive lens for examining how teachers critically evaluate and adjust their instructional practices. The theory emphasizes the practitioner's capacity for self-assessment, responsiveness to feedback, and ongoing professional growth—competencies that are crucial for effective teaching in an ever-evolving educational landscape. In this study, reflective practice is analyzed through dimensions such as pedagogical awareness, learner-centered reflection, adaptability, use of feedback and evidence, and lifelong learning. These components are essential in fostering a reflective mindset that allows teachers to make informed instructional decisions, personalize learning, and adapt to the diverse needs of their students. The use of Reflective Practice Theory allows for a deeper investigation into how teachers engage in metacognitive thinking and refine

their teaching strategies based on experience and evidence.

Integrating both theories in the study enables a more holistic understanding of how technology leadership and reflective teaching intersect in the professional lives of teachers. Transformational leadership facilitates the external change process—encouraging innovation and collaboration—while reflective practice drives internal growth through critical self-examination and instructional refinement. Together, they provide a dual lens through which teacher development, instructional effectiveness, and school improvement can be assessed and enhanced. Thus, the utilization of Transformational Leadership Theory and Reflective Practice Theory not only strengthens the conceptual basis of this study but also aligns with the broader goals of advancing teacher leadership, instructional quality, and educational innovation in the Dupax del Norte II District.

Technology leadership is a vital component of modern educational practice, especially as schools adapt to the demands of digital transformation. It refers to the ability of school leaders and teacher-leaders to envision, implement, and sustain the meaningful use of digital tools to enhance teaching, learning, and school management. Effective technology leadership among teachers involves guiding both their own practices and supporting others in leveraging technology to improve educational outcomes. This study focuses on four essential dimensions of technology leadership: technological vision, technology competence, technology professional development, and technology integration.

The first dimension, technological vision, refers to the ability of educators to articulate a coherent and inspiring roadmap for how technology will be used to achieve instructional and organizational goals. A strong technological vision provides direction, motivates collaboration, and ensures that technology use aligns with the broader educational mission. Dexter and Richardson (2019) emphasize that when teachers and administrators share a clear vision of technology's role, it leads to more strategic planning, greater teacher buy-in, and sustained innovation within the school environment. Technology competence, the second dimension, encompasses teachers' ability to use various digital tools effectively. This includes not only technical proficiency but also the pedagogical knowledge required to integrate those tools into meaningful instruction. Li and Choi (2018) argue that teacher competence in technology is no longer optional—it is essential for delivering quality education in the 21st century. Competent technology leaders model best practices, troubleshoot digital challenges, and mentor their peers in using educational technologies efficiently.

The third dimension, technology professional development, underscores the importance of continuous learning. As technologies evolve rapidly, so must the skills and knowledge of educators. Trust, Carpenter, and Krutka (2018) highlight that effective professional development should be ongoing, collaborative, and aligned with teachers' instructional needs. Teachers who engage in technology-focused professional learning communities are better prepared to adapt to new tools and strategies, fostering a culture of digital fluency across the school. Finally, technology integration refers to the actual application of digital tools in the classroom. This dimension moves beyond occasional use toward embedding technology meaningfully in instructional planning, delivery, assessment, and student engagement. Ertmer and Ottenbreit-Leftwich (2020) suggest that successful integration depends on a teacher's ability to align technology use with pedagogical goals and student needs. It also involves reflective practice and the flexibility to adjust strategies based on classroom realities.

Together, these four dimensions provide a comprehensive framework for evaluating and developing technology leadership among teachers. When educators exhibit a clear vision, demonstrate competence, engage in continuous professional growth, and integrate technology meaningfully, they become powerful agents of digital transformation. In the context of elementary education, especially in districts like Dupax del Norte II, where access and readiness vary, technology leadership ensures that the promise of educational technology is fully realized—not only to support learning outcomes but to build equitable, future-ready classrooms.

Reflective teaching is a deliberate process in which educators critically examine their instructional practices with the goal of improving student learning and fostering their own professional development. It involves the systematic analysis of teaching behaviors, decisions, and outcomes to better understand how these elements

influence student engagement and achievement. Reflective teaching is an essential practice in today's dynamic educational environment, especially as teachers are challenged to meet diverse learner needs, integrate technology, and adapt to evolving curriculum standards. This discussion focuses on five key dimensions of reflective teaching: self-assessment and pedagogical awareness, learner-centered reflection, use of feedback and evidence, adaptability and instructional improvement, and professional growth and lifelong learning.

The first dimension, self-assessment and pedagogical awareness, refers to the teacher's ability to evaluate their own instructional choices and their alignment with learning objectives. As Larrivee (2020) notes, reflective teachers engage in critical self-questioning to identify the assumptions behind their teaching strategies and to assess their instructional effectiveness. This process cultivates awareness of one's pedagogical identity and encourages more intentional, student-responsive teaching. Learner-centered reflection, the second dimension, emphasizes reflection that prioritizes student experiences, needs, and outcomes. According to Fessehatsion (2018), reflective teachers continuously analyze how their teaching supports or hinders student learning, engagement, and participation. This form of reflection fosters a classroom environment that values student voice and recognizes diverse learning styles and backgrounds. The third dimension, use of feedback and evidence, involves the integration of qualitative and quantitative data to inform teaching practices. Reflective educators make use of student feedback, assessment results, and peer observations to refine their instructional decisions. Farrell (2019) emphasizes that collecting and responding to evidence promotes data-informed reflection, which leads to more targeted and effective teaching interventions.

Adaptability and instructional improvement, the fourth dimension, highlights the teacher's willingness to revise instructional strategies in response to classroom realities. As noted by Bouchard (2018), reflective teachers do not rigidly adhere to prescribed methods but remain open to experimentation and adjustment. This dimension is especially important in addressing unexpected challenges, integrating new technologies, and customizing instruction for varied student needs. The fifth and final dimension, professional growth and lifelong learning, reflects a long-term commitment to continuous self-improvement. Reflective practice is not a one-time event but a sustained process that contributes to ongoing professional development. Trust, Krutka, and Carpenter (2018) argue that engaging in reflective dialogue within professional learning communities or networks enhances teachers' motivation and professional identity, while also encouraging collaboration and shared growth. Based on the theories and concepts presented above, it is the assumption of this study that technology leadership practice is related with reflective teaching approaches of the teacher respondents.

### **3. Methodology**

This study employed a quantitative descriptive–correlational research design to examine the relationship between technology leadership practices and reflective teaching approaches among elementary school teachers in Dupax del Norte II District, Schools Division of Nueva Vizcaya, Philippines. Quantitative research was appropriate for this investigation because it allowed systematic collection and statistical analysis of numerical data to identify patterns and relationships between variables (Creswell & Creswell, 2018). The descriptive component enabled the determination of the current levels of technology leadership practices and reflective teaching approaches among teachers, while the correlational component examined whether a statistically significant relationship existed between the two constructs without manipulating the research environment (Fraenkel, Wallen, & Hyun, 2019). The study did not aim to establish causality but to determine the strength and direction of association using Pearson's product–moment correlation coefficient (Gravetter & Wallnau, 2020). The investigation was anchored on Transformational Leadership Theory (Bass & Riggio, 2006) and Reflective Practice Theory (Schön, 1983), which provided the theoretical grounding for examining leadership behaviors and reflective pedagogical practices in basic education.

The research was conducted in Dupax del Norte II District, one of the administrative units under the Schools Division of Nueva Vizcaya, Department of Education–Region II. The district comprises eleven public elementary schools serving geographically diverse rural and upland communities, collectively catering to approximately 1,294

learners guided by 87 permanent teachers. Despite its rural context, the district has actively supported professional development initiatives such as Learning Action Cells (LAC), school-based training programs, and the integration of technology aligned with the Most Essential Learning Competencies (MELCs). However, contextual challenges including intermittent internet connectivity and varying levels of teacher digital competence made it relevant to investigate technology leadership and reflective teaching practices within this setting.

The respondents consisted of 71 permanent elementary school teachers, representing 81.61% of the total population of 87 teachers. The sample size was determined using Slovin's formula to ensure statistical validity and manageability. A stratified random sampling technique was employed, with each of the eleven schools serving as a stratum to ensure proportional representation. Within each stratum, simple random sampling was conducted to minimize bias and ensure that all eligible teachers had an equal chance of participation. Ethical standards were strictly observed, with voluntary participation, informed consent, anonymity, and confidentiality maintained throughout the study.

Data were gathered using two validated survey instruments. The Technology Leadership Practices Questionnaire, developed by Agustin et al. (2025), consisted of 40 items and demonstrated strong internal consistency (Cronbach's  $\alpha = 0.875$ ). Responses were measured on a four-point Likert scale ranging from Strongly Disagree to Strongly Agree, with mean scores interpreted using established descriptive levels. The Reflective Teaching Approaches Questionnaire, developed by Naui et al. (2025), contained 30 items across five dimensions and yielded a high reliability coefficient (Cronbach's  $\alpha = 0.902$ ). This instrument utilized a five-point Likert scale ranging from Strongly Disagree to Strongly Agree, with corresponding qualitative interpretations for mean scores. Both instruments underwent validation procedures prior to administration to ensure content relevance and reliability.

Prior to data collection, formal approval was secured from the District-In-Charge and respective school heads. Questionnaires were distributed in printed form and, when necessary, through digital platforms. Respondents were given adequate time to complete the instruments, after which the questionnaires were retrieved, screened for completeness, and encoded for statistical analysis. Data were analyzed using the mean to determine the levels of technology leadership practices and reflective teaching approaches, while Pearson's product-moment correlation coefficient was employed to examine the relationship between the two variables. Correlation results were interpreted following the guidelines of Schober et al. (2018). All analyses were conducted at an appropriate level of significance to determine meaningful associations between the constructs under investigation.

#### **4. Results and Discussion**

This research primarily aimed to examine the technology leadership practices of public elementary school teachers in the Dupax del Norte II District, with particular focus on four key dimensions: technological vision, technology competence, technology-related professional development, and technology integration. In addition, the study explored teachers' prevailing reflective teaching approaches, analyzed across five dimensions—self-assessment and pedagogical awareness, learner-centered reflection, utilization of feedback and evidence, adaptability and instructional improvement, and commitment to professional growth and lifelong learning.

The respondents consisted of 88 permanent teachers who were selected through Slovin's formula and stratified sampling technique during the academic year 2025–2026. Data were gathered using a validated and reliable researcher-made questionnaire designed to capture both technology leadership and reflective teaching practices. Collected responses were analyzed using appropriate descriptive and inferential statistical tools, including weighted mean and Pearson product-moment correlation (Pearson  $r$ ). The hypotheses were tested at a 0.05 level of significance to determine the strength and direction of the relationships between technology leadership dimensions and reflective teaching practices. This approach ensured a systematic and evidence-based analysis of the variables under investigation.

The study aimed to determine the respondents' perceptions of their technology leadership practices across the

dimensions of technological vision, technology competence, technology professional development, and technology integration. It also sought to identify the respondents' perceptions of their reflective teaching approaches in terms of self-assessment and pedagogical awareness, learner-centered reflection, use of feedback and evidence, adaptability and instructional improvement, and professional growth and lifelong learning. Furthermore, the study examined the significant relationships between the dimensions of technology leadership practices and reflective teaching approaches. Finally, based on the significant findings of the study, an educational management intervention was developed to sustain and further enhance the technology leadership practices and reflective teaching approaches of the respondents. The following are the significant findings of the study.

1. The respondents perceived technology leadership practices to be strong and well established, with an overall mean of 3.20, interpreted as high. This indicates that school leaders effectively promote and support the integration of technology in teaching and learning. Technology Vision obtained the highest mean (3.34), reflecting clear leadership direction and strategic planning for digital innovation. Technology Integration followed with a mean of 3.23, showing that teachers regularly use digital tools to enhance instruction and student engagement. Technology Professional Development recorded a mean of 3.19, suggesting the presence of relevant capacity-building opportunities. Meanwhile, Technology Competence (3.02), though still high, indicates the need for continued training and sustained support to further strengthen teachers' technological skills.

2. The respondents perceived their reflective teaching approaches to be high, with an overall mean of 3.34, indicating active engagement in reflective practices that enhance instruction and professional growth. The highest-rated dimension was Use of Feedback and Evidence ( $\bar{x} = 3.42$ ), showing strong reliance on assessment results and feedback to improve teaching. Learner-Centered Reflection ( $\bar{x} = 3.34$ ) and Adaptability and Instructional Improvement ( $\bar{x} = 3.35$ ) likewise reflect teachers' responsiveness to learners' needs and instructional flexibility. Self-Assessment and Pedagogical Awareness ( $\bar{x} = 3.33$ ) and Professional Growth and Lifelong Learning ( $\bar{x} = 3.28$ ) further demonstrate a sustained commitment to reflective, evidence-based, and continuously improving teaching practices.

3. The results reveal a strong and significant relationship between technology leadership practices and reflective teaching approaches ( $r = 0.761$ ,  $p = 0.001$ ). This indicates that effective technology leadership fosters teachers' reflective behaviors, instructional improvement, and professional growth. Technology Integration ( $r = 0.641$ ) and Technology Professional Development ( $r = 0.639$ ) show moderate positive correlations, emphasizing that meaningful digital integration and continuous training encourage reflective practice. Technological Vision ( $r = 0.577$ ) supports alignment between leadership goals and teaching reflection, while Technology Competence ( $r = 0.562$ ) highlights the influence of leaders' digital proficiency on teachers' reflective engagement. Overall, strong technology leadership cultivates a reflective, improvement-oriented teaching culture.

4. The training design was developed to address identified gaps in technology leadership and reflective teaching, based on the lowest-mean indicators from the study. It targets both teachers and school heads through focused, practical modules aligned with Learning Action Cell (LAC) implementation. Four technology leadership topics emphasize vision, competence, integration, and strategic resource use, while five reflective teaching topics strengthen self-awareness, learner-centered planning, evidence-based decision-making, adaptability, and professional growth. The program promotes collaborative learning, reflective practice, and instructional improvement. Overall, it aims to enhance leadership capacity, strengthen reflective teaching, and support continuous professional development to improve classroom practices and student learning outcomes.

## 5. Conclusions

Based on the significant findings above, the following conclusions were drawn

- Respondents perceived technology leadership practices as strong and well-established, indicating that school leaders effectively support and promote the integration of technology in teaching and learning.

- Respondents rated their reflective teaching approaches as high, showing active engagement in practices that improve instruction and professional growth.
- There is a strong and significant relationship between technology leadership and reflective teaching, suggesting that effective leadership fosters teachers' reflection, instructional improvement, and professional development.
- The developed training design addressed gaps in technology leadership and reflective teaching through focused, LAC-aligned modules, enhancing leadership capacity, reflective practices, collaboration, evidence-based decision-making, and overall teaching effectiveness, ultimately benefiting student learning outcomes.

**Recommendations** - Based on the above conclusions, the following recommendations are proposed:

- School leaders may continue to develop and model effective technology leadership by articulating clear visions, providing strategic guidance, and supporting teachers in integrating digital tools. Regular workshops, mentoring, and leadership forums can enhance administrators' capacity to drive technology initiatives aligned with instructional goals.
- Teachers may be encouraged to engage in systematic reflective practices, including self-assessment, learner-centered evaluation, and the use of classroom data. Schools can institutionalize reflective routines through structured journals, peer observations, and collaborative discussions to improve instructional quality and professional growth.
- Implement ongoing Learning Action Cell (LAC) sessions and peer-learning opportunities that integrate both technology leadership and reflective teaching. This collaborative approach can strengthen teacher capacity, foster evidence-based decision-making, and encourage the sharing of best practices in instructional innovation.
- Schools may provide continuous professional development programs focused on technology integration, instructional adaptability, and reflective teaching. This ensures teachers and administrators remain competent, agile, and responsive to evolving educational technologies and diverse learner needs.
- Future researchers are encouraged to replicate this study in other districts or educational levels to validate the findings, identify contextual differences, and further explore the relationship between technology leadership and reflective teaching, thereby contributing to broader educational improvement and policy development.

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