Original Article

Digital Leadership Practices and Teachers' Technology Integration in Buluan District, BARMM: A Descriptive-Correlational Study

Dianne Rose M. Dupa iD

Author Information:

Datu Luminog Mangelen Pilot Elementary School, Buluan, Maguindanao del Sur, Philippines

Correspondence:
diannerosedupa@sksu.edu.ph

Abstract. This study examined the digital leadership practices of school heads in the Buluan District, BARMM, and their relationship with teachers' integration of technology in instructional practices. Guided by Sheninger's Digital Leadership Theory and Fred Davis's Technology Acceptance Model (TAM), the study explored how leadership practices are associated with teachers' technology use based on perceived usefulness and ease of use. Using a quantitative descriptive-correlational design, data were collected from 10 school heads and 160 elementary teachers using the ISTE-based Digital Leadership Scale and the Teacher Technology Integration Survey, both on a 5-point Likert scale. Results showed that school heads demonstrated high digital leadership overall, with comparatively lower scores in visionary leadership and professional excellence. Teachers exhibited moderate technology integration, with instructional use rated high. Correlation analysis revealed a weak, statistically non-significant relationship between school heads' digital leadership and teachers' technology integration $(\tau=0.14, p=.587)$, suggesting that leadership alone is insufficient to ensure effective classroom technology use. Findings highlight the need for supportive conditions, including ICT infrastructure, professional development, mentoring, and a positive school culture, to enhance technology integration in underserved areas.

Keywords: Digital leadership; Instructional practices; School heads; Technology integration; Teachers.

The rapid advancement of technology has significantly transformed the educational landscape, offering both challenges and opportunities for school leaders and teachers. Globally, digital leadership is essential for guiding schools through technology adoption, innovation, and organizational change, leveraging technology to create well-organized systems that establish direction, influence social action, initiate sustainable change, and foster relationships within educational communities (Trenerry et al., 2021; AlAjmi, 2022). School leaders play a crucial role in facilitating teachers' technology integration and professional development.

In the Philippine context, digital leadership is integral to advancing the goals of Education 4.0, emphasizing innovation, technology integration, and learner-centered approaches. National policies support this vision. DepEd Order No. 16, s. 2023, emphasizes equitable access to ICT infrastructure, tools, and training. This aims to enhance teachers' and school leaders' digital competencies and support effective teaching, learning, and school operations

(Department of Education, 2023). Similarly, the Basic Education Act of 2001 (Republic Act No. 9155) mandates school heads to oversee both administrative and instructional supervision, positioning them as pivotal actors in driving school improvement. The International Society for Technology in Education (ISTE) further supports these expectations through the ISTE Standards for Education Leaders, which outline the digital leadership competencies needed to effectively guide technology integration and school transformation (ISTE, 2024). The COVID-19 pandemic further highlighted the urgent need for digital leadership to enable schools to shift to online learning platforms and maintain educational continuity (Koh & Daniel, 2022).

Despite growing recognition, empirical research on how school heads in the Philippines, particularly in BARMM, implement ISTE-aligned digital leadership practices to support teachers' technology integration remains limited. Evidence linking leadership dimensions to multi-domain measures of teacher technology integration in BARMM, particularly at the district level, remains underexplored. Teachers in the region face significant challenges in using ICT and integrating technology within classrooms, including limited training, inadequate access to devices, and restrictive curricula, particularly in rural and underserved areas with poor infrastructure and connectivity (Andarwulan et al., 2021; Trenerry et al., 2021; AlAjmi, 2022; Ampang, 2023; Dioquino & Paglinawan, 2024). Philippine-based studies indicate that school leaders' strategies significantly influence teachers' adoption of technology; however, the specific application of ISTE-aligned leadership dimensions at the district level in BARMM remains underexplored.

To address these gaps, this study draws on Sheninger's Digital Leadership Theory, which emphasizes culture, vision, learning, communications, and digital citizenship, alongside Fred Davis's Technology Acceptance Model (TAM), to examine how school heads' digital leadership influences teachers' technology integration in instructional practices. This study aims to examine the relationship between school heads' digital leadership practices and teachers' technology integration in instructional practices in the Buluan District, BARMM. The findings aim to provide evidence-based guidance for educational leaders and policymakers in promoting effective technology integration in underserved contexts.

Methodology

Research Design
The study employed a quantitative descriptive-correlational research design to examine the relationship between school heads' digital leadership and teachers' technology integration in instructional practices. According to Creswell and Creswell (2018), correlational research examines the extent and direction of relationships among variables without manipulation, whereas descriptive research documents existing conditions as they naturally occur. This design was appropriate for describing the study variables and analyzing their relationship within a natural education setting.

Participants and Sampling
The respondents of the study included all school heads and teachers in the Buluan District. According to the Enhanced Basic Education Information System (EBEIS, 2025), the district currently comprises 10 school heads—2 principals and 8 teachers-in-charge— and 160 elementary-grade teachers, including permanent, contractual, provisional, volunteer teachers, and those assigned to the ISAL (Islamic Studies and Arabic Language) and ALIVE (Arabic Language and Islamic Values Education) programs. In total, 170 respondents participated in the study.

A complete enumeration(census) approach was employed because the population size was manageable and accessible. Since all members of the defined population were included, sampling selection procedures were not required. This approach ensured full representation of the district and eliminated sampling error within the specified population. As noted by Field (2018), census studies are appropriate when the population is small and fully accessible, particularly when the objective is to describe characteristics and examine relationships within a defined group rather than to generalize beyond it.

The response rate was 100%, and all questionnaires were complete and valid for analysis. Because the study covered the entire population of school heads and teachers in the district, the findings describe and examine relationships within this specific population. The results are therefore limited to the Buluan District and are not intended to be generalized to other districts or regions.

Research Instrument
The primary instrument was adapted from Alajmi (2022), titled *"The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait",* which employed two survey forms: (a) the School Heads' Digital Leadership Practices Assessment Form, and (b) Teachers' Technology Integration Survey Form, to measure the extent of digital leadership among school heads and its influence on teachers' technology integration in instructional practices. The Principal Technology Leadership Assessment, grounded in ISTE (2014) Standards, was used to examine the school heads' digital leadership. It consists of five sections: *Visionary Leadership, Digital-age Learning Culture, Professional Excellence, Systematic Improvement, and Digital Citizenship.* To assess teachers' technology integration, the Teacher Technology Integration Survey was used, adapted from Vannatta and Banister's (2009) study. It includes three constructs: Administrative Use, Instructional Use, and Communication Use.

Content validity of the adapted instrument was established through evaluation by a panel of three experts in educational leadership and management. Quantitative evaluation of content validity was performed as part of the instrument validation procedure using the Content Validity Index (CVI). Experts rated each item on a four-point relevance scale, with ratings of 3 or 4 indicating item relevance. The Item-Level Content Validity Index (I-CVI) ranged from 0.67 to 1.00, while the Scale-Level Content Validity Index (S-CVI/Ave) was 0.92, indicating excellent content validity. Reliability was further verified through pilot testing prior to data collection. Internal consistency reliability was assessed using Cronbach's alpha, yielding a coefficient of 0.81, indicating good reliability (Field, 2018).

Data Analysis
The study analyzed school heads' digital leadership and its influence on teachers' technology integration using descriptive statistics (mean and standard deviation) and inferential analysis. The dataset comprised responses from 10 school heads and 160 teachers, measured on 5-point Likert scales. Data were examined for completeness, consistency, and outliers; all responses were deemed valid for analysis. Descriptive statistics indicated approximately symmetric distributions, with skewness and kurtosis values within acceptable ranges for Likert scale data, suggesting no serious violations of normality assumptions.

Because teachers are nested within the schools, teacher technology integration scores were aggregated at the school level by computing the mean per school (n=10) to align with each school head's digital leadership score. Kendall's Tau B was then computed at the school level. The small number of schools may limit the generalizability of the correlation results, which is acknowledged as a study limitation. Correlation strength was interpreted using a 5-point scale, from very strong to no correlation. This approach ensures appropriate statistical application and reliable interpretation of the observed relationship (Field, 2018).

Data Gathering Procedure
To gather the necessary data from the respondents, the researcher first secured approval from the Dean of the Institute of Graduate Studies. A request letter was sent to the School Division Superintendent of Maguindanao del Sur to obtain permission to conduct the study. Information on all teachers was obtained from FORM 3 of the Enhanced Basic Education Information System (EBEIS, 2025). Letters of request were then sent to the school heads in the different schools in the Buluan District. Once approvals were granted, the survey questionnaires were distributed and later collected. The researcher consulted a statistician to ensure proper application of statistical tests and accurate interpretation of the findings.

Ethical Considerations
This study adhered to ethical research standards to safeguard the rights, privacy, and dignity of all participants. Prior to completing the survey, participants were fully informed about the study's purpose, their voluntary participation, and their right to withdraw at any time without any negative consequences. Informed consent was also obtained from all participants. The study protocol was reviewed and approved by the Institutional Ethics Review Committee of Sultan Kudarat State University, ensuring full compliance with ethical research standards in education. To maintain anonymity, no personal identification information was collected, and all responses were kept strictly confidential. Data were used exclusively for academic purposes and securely stored to prevent unauthorized access. Throughout the research process, the researcher ensured transparency, respect, and fairness in all interactions with participants.

Results and Discussion

Extent of Digital Leadership Practiced by School Heads in Terms of Visionary Leadership

School heads' digital leadership in terms of Visionary Leadership was evident. The table below indicates a high level of practice (M = 3.50, SD = 0.36) among the school heads in the Buluan District. This indicates that they actively develop and communicate technology-infused strategic plans, facilitate school-wide change, and promote initiatives that support the integration of digital tools into teaching and learning.

Table 1. *Extent of Digital Leadership Practiced by School Heads in Terms of Visionary Leadership*

Indicators	Mean	SD	Interpretation
Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans.	3.60	0.52	High Extent
Facilitate a change that maximizes learning goals using digital resources.	3.50	0.53	High Extent
Promote programs and funding to support implementation of technology-infused plans.	3.40	0.52	Moderate Extent
Overall Mean	**3.50**	**0.36**	**High Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

These practices align with Sheninger's (2014) Digital Leadership Theory, which emphasizes articulating a clear vision, fostering a culture of innovation, and guiding systemic improvements to enhance instructional and organizational outcomes. These findings are also supported by the ISTE standards for School Leaders, which emphasize a vision-driven, equity-focused, and innovative use of technology to support teaching and learning (ISTE, 2024). However, gaps in resource mobilization and funding suggest the need for strengthened advocacy, stakeholder collaboration, and institutional support to ensure the sustainability and impact of technology-driven initiatives (Raptis et al, 2024; Maala & Lagos, 2022).

Extent of Digital Leadership Practiced by School Heads in Terms of Digital-Age Learning Culture

Digital leadership practices related to a digital-age learning culture were highly evident among school heads, with an overall mean of 3.60 (SD = 0.38).

Table 2. *Extent of Digital Leadership Practiced by School Heads in Terms of Digital-Age Learning Culture*

Indicators	Mean	SD	Interpretation
Continuous improvement of digital learning.	4.00	0.47	High Extent
Model and promote the frequent and effective use of technology for learning.	3.70	0.48	High Extent
Ensure effective practice in the study of technology and its infusion across the curriculum.	3.50	0.53	High Extent
Promote and participate in learning communities that stimulate innovation, creativity, and digital collaboration.	3.50	0.53	High Extent
Provide a learning environment with technology and learning resources to meet the diverse needs of all learners.	3.30	0.48	Moderate Extent
Overall Mean	**3.60**	**0.38**	**High Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

The results show that school leaders engage in actions that support continuous improvement of digital learning, model the effective use of technology, integrate technology across the curriculum, and participate in collaborative learning communities that encourage innovation and creativity. However, while most practices were implemented to a high extent, providing adequate technological resources to address diverse learner needs was rated comparatively lower, reflecting ongoing challenges related to infrastructure and equitable access.

These findings suggest that establishing a digital-age culture requires both leadership efforts and adequate institutional support, particularly in infrastructure and teacher capacity-building. The results align with Sheninger's Digital Leadership Theory, which emphasizes the role of school leaders in fostering innovative learning environments. Similarly, the ISTE 2024 standards highlight the creation of inclusive, flexible, and technology-rich learning environments that support all learners (ISTE, 2024). Philippine studies also report that infrastructure, connectivity, and teacher readiness constraints hinder effective technology integration, underscoring the need for systemic support to achieve inclusive and sustainable digital transformation (Tanucan et al., 2022; Barrot, 2023; Tortola, 2024).

Extent of Digital Leadership Practiced by School Heads in Terms of Professional Excellence

The results in Table 3 indicate that school heads exhibit a high level of practice in Professional Excellence (M = 3.50, SD = 0.36). The results suggest that school heads actively promote continuous professional development,

allocate resources for technology-related training, and support teachers in strengthening their digital competencies. While structured professional growth initiatives were evident, relatively lower ratings in collaborative learning communities and research engagement suggest opportunities to enhance mentoring, knowledge sharing, and evidence-based practice.

Table 3. *Extent of Digital Leadership Practiced by School Heads in Terms of Professional Excellence*

Indicators	Mean	SD	Interpretation
Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration.	3.80	0.42	High Extent
Emerging trends of effective use of technology and encourage new technologies for the potential to improve student learning.	3.50	0.53	High Extent
Facilitate and participate in learning communities that stimulate and support faculty in the study and use of technology.	3.40	0.52	Moderate Extent
Promote and model effective communication and collaboration among stakeholders using digital-age systematic tools.	3.40	0.52	Moderate Extent
Stay up to date on educational research.	3.40	0.52	Moderate Extent
Overall Mean	**3.50**	**0.36**	**High Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

These findings underscore that teacher capacity-building is a key strategy for improving technology integration and instructional effectiveness. Consistent with Sheninger's Digital Leadership Theory, professional excellence emphasizes sustained professional growth, mentoring, and collaborative learning to empower teachers and support meaningful digital transformation. Empirical evidence in the Philippine context similarly demonstrates that school heads' technological leadership significantly influences teachers' competence, confidence, and effective use of digital tools (Sheninger, 2014; Maala & Lagos, 2022; Tortola, 2024).

Extent of Digital Leadership Practiced by School Heads in Terms of Systematic Improvement
As presented in Table 4, school heads demonstrate a high level of digital leadership in systematic improvement (M = 3.75, SD = 0.33). The results indicate that they consistently engage in strategic planning, data-informed decision-making, infrastructure development, and personnel alignment to enhance organizational effectiveness and instructional outcomes through technology. High mean scores across indicators suggest that they not only implement systematic improvement practices but also integrate these processes to ensure that technology supports both management operations and teaching and learning goals.

Table 4. *Extent of Digital Leadership Practiced by School Heads in Terms of Systematic Improvement*

Indicators	Mean	SD	Interpretation
Recruit highly competent personnel who use technology to advance academic and operational goals.	4.00	0.36	High Extent
Collaborate to establish metrics, collect, and analyze data, and share findings to improve staff performance and student learning.	3.70	0.48	High Extent
Establish and leverage strategic partnerships to support systematic improvement.	3.70	0.48	High Extent
Establish and maintain a robust infrastructure for technology to support management, operations, teaching, and learning.	3.60	0.52	High Extent
Lead purposeful change to reach learning goals using technology and media-rich resources.	3.50	0.53	High Extent
Overall Mean	**3.75**	**0.33**	**High Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

The findings align with Sheninger's Digital Leadership Theory, which emphasizes embedding technology into school structures, processes, and policies to drive sustainable change, continuous performance improvement, and data-driven decision-making. Supporting studies indicate that leadership support, strategic management, and institutional capacity-building significantly strengthen technology integration and school improvement efforts, particularly in developing educational contexts where challenges such as limited resources, connectivity, and teacher readiness may impede progress. These findings suggest that systematic improvement practices, when combined with appropriate institutional support, play a pivotal role in advancing school performance and sustaining meaningful digital transformation (Sheninger, 2014; AlAjmi, 2022; Maala & Lagos, 2022; Barrot, 2023).

Extent of Digital Leadership Practiced by School Heads in Terms of Digital Citizenship
Findings reveal that school heads demonstrate a high level of digital leadership practice in digital citizenship (M=3.60, SD=0.47). The results indicate that school heads in the Buluan District actively model and facilitate the

responsible, ethical, and safe use of technology, ensure access to appropriate digital tools for all learners, and establish policies that promote digital literacy, accountability, and global awareness. High mean scores across the indicators suggest that school heads not only advocate for ethical use of technology but also embed digital citizenship practices into daily school operations and learning environments, fostering a culture of respect, collaboration, and informed digital participation.

These findings were consistent with Sheninger's Digital Leadership Theory, which emphasizes the role of school leaders in modeling appropriate digital behavior, embedding ethical practices into school policies, and ensuring equitable access to technology. Leadership actions in promoting digital citizenship are critical in cultivating responsible technology use and protecting learners in digital environments. Supporting studies also indicate that strong leadership guidance, institutional safeguards, and policy frameworks significantly enhance ethical and safe integration of technology, contributing to meaningful learning and accountability in school communities (Sheninger, 2014; Koh & Daniel, 2022; Malik, 2023). Collectively, these results also highlight that effective digital citizenship practices require both leadership initiative and systemic support to sustain safe, responsible, and equitable use of technology across the school (ISTE, 2024).

Table 5. *Extent of Digital Leadership Practiced by School Heads in Terms of Digital Citizenship*

Indicators	Mean	SD	Interpretation
Model and facilitate the development of a shared cultural understanding and involvement in global issues through communication and collaboration tools.	3.70	0.48	High Extent
Ensure access to appropriate digital tools and resources to meet the needs of all learners.	3.60	0.52	High Extent
Promote, model, and establish policies for safe, legal, and ethical use of digital information and technology.	3.60	0.52	High Extent
Promote and model responsible social interactions related to the use of technology and information.	3.50	0.71	High Extent
Overall Mean	**3.60**	**0.47**	**High Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

Summary of the Extent of Digital Leadership Practiced by School Heads

An overview of digital leadership among school heads, based on the ISTE Standards for Leaders, across five key dimensions—*Visionary Leadership, Digital Age Learning Culture, Professional Excellence, Systematic Improvement, and Digital Citizenship – demonstrates generally high levels of practice, with mean scores ranging from 3.50 to* 3.75. The overall mean of 3.59 (SD=0.08) reflects a strong, consistent perception of digital leadership, indicating consensus among school heads. Overall, these findings suggest that school heads actively integrate technology into their leadership practices and promote a culture of ethical, innovative, and professional digital practices. This aligns with ISTE standards for education leaders (ISTE, 2014; ISTE, 2024).

Table 6. *Summary of the Extent of Digital Leadership Practiced by School Heads*

Indicators	Mean	SD	Interpretation
Visionary Leadership	3.50	0.52	High Extent
Digital-age Learning Culture	3.60	0.38	High Extent
Professional Excellence	3.50	0.36	High Extent
Systematic Improvement	3.75	0.33	High Extent
Digital Citizenship	3.60	0.47	High Extent
Overall Mean	**3.59**	**0.08**	**High Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

The consistently high ratings across all five dimensions indicate that school heads demonstrate comprehensive digital leadership practices that support vision-setting, innovative learning cultures, professional growth, organizational improvement, and responsible use of technology. This multidimensional profile aligns with Sheninger's Digital Leadership framework, which identifies vision, culture, professional excellence, systemic improvement, and citizenship as interconnected drivers of effective school transformation. Supporting research confirms that integrated leadership practices across these domains contribute to stronger teacher technology integration and improved educational outcomes (Sheninger, 2014; AlAjmi, 2022; Trenerry et al., 2021).

Extent of Teachers' Technology Integration Practiced in Administrative Use

The extent of teachers' technology integration in administrative tasks was moderate (M=3.15, SD= 0.68). Teachers primarily relied on familiar and accessible tools, such as spreadsheets and grading programs, while less familiar

technologies, such as handheld devices, were used only minimally. From the perspective of the Technology Acceptance Model (TAM), this pattern suggests that teachers are more likely to adopt technologies they perceive as useful and easy to use. In contrast, unfamiliar or complex tools are less frequently integrated.

Table 7. *Extent of Teachers' Technology Integration Practiced in Administrative Use*

Indicators	Mean	SD	Interpretation
Use a spreadsheet (or grading program grade book and/or attendance).	4.08	0.82	High Extent
Use spreadsheets or databases to organize and analyze student performance data for reporting purposes.	3.56	1.00	High Extent
Prepare and maintain Individualized Education Plans (IEPs) using computer-based systems or software.	3.35	0.94	Moderate Extent
Employ technology to track classroom resources and supplies.	3.23	0.97	Moderate Extent
Use of a handheld device (Palm Pilot) to organize information.	1.56	0.88	Very Low Extent
Overall Mean	**3.15**	**0.68**	**Moderate Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

These findings indicate that administrative technology use is shaped by accessibility, familiarity, and perceived usefulness. The moderate level of integration highlights areas where additional support is needed to enhance efficiency, accuracy, and data-driven decision-making in administrative tasks. Studies by Ampang (2023) report that resource-constrained contexts, such as BARMM, as well as limitations in ICT infrastructure, device availability, and internet connectivity, further restrict teachers' consistent use of digital tools for administrative functions. In line with RA 9155 and DepEd Order No. 16, s. 2023, which emphasizes supervision and management responsibilities of school heads, these results underscore the importance of targeted professional development, adequate resources, and leadership support to build teachers' competence and confidence in using a wider range of digital tools for administrative purposes.

Extent of Teachers' Technology Integration Practiced in Instructional Use
Teachers' technology integration in instructional tasks was rated at a high extent overall (M= 3.53, SD= 0.88), indicating that technology is commonly incorporated into instructional planning, preparation, and classroom delivery in the Buluan District. The consistent high ratings across all indicators suggest that technology has become a routine part of teaching practices, supporting the development of instructional materials, access to information, presentation of content, and adaptation of learning activities to students' needs.

Table 8. *Extent of Teachers' Technology Integration Practiced in Instructional Use*

Indicators	Mean	SD	Interpretation
Use the computer to create instructional handouts or assessments.	3.71	1.05	High Extent
Use the Internet to gather information for lesson planning.	3.64	1.01	High Extent
Use technology to present information to students.	3.46	1.02	High Extent
Demonstrate computer applications.	3.42	0.96	High Extent
Use technology to adapt an activity to a student's individual needs.	3.42	0.96	High Extent
Overall Mean	**3.53**	**0.88**	**High Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

These findings indicate a generally positive level of technology adoption, consistent with the assumptions of the Technology Acceptance Model (TAM), which explains that teachers are more likely to integrate technologies they perceive as useful and manageable within their instructional routines. In line with this, the studies of Maala & Lagos (2022) and Padolina-Alcantara (2023) on teachers' technology integration highlight that leadership support, adequate resources, and continuous professional development are essential factors that enable teachers to integrate digital tools effectively, thereby improving instructional delivery and student learning outcomes. Similarly, Andarwulan et al. (2021) found that teacher readiness and perceived ease of use positively affect the adoption of instructional technology.

Extent of Teachers' Technology Integration Practiced in Communication Use
Teachers' technology integration for communication was described as practiced at a moderate level (M=3.00, SD=1.08). Social media platforms were the most frequently used tools. In contrast, formal tools like email, websites, and electronic bulletin boards were less used, indicating selective adoption based on the convenience and accessibility of digital tools.

Table 9. *Extent of Teachers' Technology Integration Practiced in Communication Use*

Indicators	Mean	SD	Interpretation
Post/share class announcements on social media.	3.50	1.10	High Extent
Use Email to communicate with colleagues/administrators.	3.06	2.04	Moderate Extent
Use platforms to communicate with department heads/principals.	3.00	1.10	Moderate Extent
Use Email to communicate with students/parents.	2.64	1.15	Moderate Extent
Post class information on electronic bulletin boards/websites/blogs.	2.42	1.24	Low Extent
Overall Mean	**3.00**	**1.08**	**Moderate Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

Supporting this, Maala & Lagos (2022) highlighted that leadership support and targeted training are essential for expanding teachers' use of digital tools, while Padolina emphasized that access to reliable digital tools strengthens communication practices and enhances engagement with students, parents, and colleagues. The moderate overall integration and reliance on familiar platforms indicate the need for collaborative professional development and mentoring to strengthen teachers' digital competence and confidence in communication tasks (Malik, 2023; Casilao et al., 2025). Moreover, these observations are consistent with Andarwulan et al. (2021), who noted that teachers' familiarity and readiness shape their adoption of communication technologies in classrooms.

Extent of Teachers' Technology Integration Practiced in Professional Development Use
Table 10 shows that teachers' use of technology for professional development was moderate overall (M = 3.14, SD = 0.94). While teachers frequently engage in informal sharing of strategies with colleagues, participation in formal technology-focused training or structured professional development programs remains limited. This indicates that although teachers recognize the value of technology for professional growth, the limited availability of formal opportunities may constrain their digital competence, pedagogical confidence, and ability to fully integrate technology into instruction.

These findings underscore the importance of strengthening structured professional development, mentoring, and collaborative capacity-building initiatives, which align with the Technology Acceptance Model (TAM). Teachers use digital tools they perceive as useful and manageable. Malik (2023) highlights that structured professional development and mentoring enhance teachers' confidence and competence in using digital tools effectively. Similarly, Dioquino & Paglinawan (2024) stress that collaborative capacity-building initiatives foster continuous instructional practices, ultimately improving teaching and learning outcomes. Andarwulan et al. (2021) similarly emphasized that teachers' readiness and perceived usefulness influence participation in professional development technology initiatives.

Table 10. *Extent of Teachers' Technology Integration Practiced in Professional Development Use*

Indicators	Mean	SD	Interpretation
Share technology-based teaching strategies with colleagues.	3.27	0.95	Moderate Extent
Stay informed about the latest educational technology trends.	3.26	1.10	Moderate Extent
Participate in online courses or certifications.	3.09	1.11	Moderate Extent
Participate in professional development opportunities focused on technology integration.	3.06	0.96	Moderate Extent
Regularly attend training on new educational technologies or tools.	2.99	0.97	Moderate Extent
Overall Mean	**3.14**	**0.94**	**Moderate Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

Extent of Teachers' Technology Integration Practiced in Technology Proficiency Use
Teachers' technology integration related to Technology Proficiency use reveals a moderate level of practiced overall proficiency (M = 3.00, SD = 0.96). Teachers reported the highest confidence in using digital tools, such as learning management systems and virtual classrooms, to facilitate learning (M = 3.13, SD = 1.05), but the lowest access to necessary technology and infrastructure (M = 2.69, SD = 0.95), highlighting that resource limitations may hinder effective technology use and impact instructional outcomes. These findings imply that teachers may possess a baseline level of digital competence, but their ability to fully integrate technology is constrained by inadequate access to devices, software, and infrastructure.

Table 11. *Extent of Teachers' Technology Integration Practiced in Technology Proficiency Use*

Indicators	Mean	SD	Interpretation
Feel confident using digital tools to facilitate learning.	3.13	1.05	Moderate Extent
Understand how to use educational apps/software for lesson planning.	3.11	1.11	Moderate Extent
Regularly use technology to track student progress and adjust instruction.	3.11	1.10	Moderate Extent
Can troubleshoot basic technological issues.	2.99	1.01	Moderate Extent
Have access to necessary technology/infrastructure.	2.69	0.95	Moderate Extent
Overall Mean	**3.00**	**0.96**	**Moderate Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21-5.00 =Very High Extent)

Research indicates that external barriers limit the adoption and effective use of technology. While teachers' confidence influences technology use, the Technology Acceptance Model (TAM) highlights that even when teachers perceive technology as useful and feel capable, systemic constraints, such as limited ICT resources, inconsistent training, and uneven professional development, can hinder effective implementation. The moderate proficiency observed reflects variations in access, experience, and support, underscoring the need for targeted professional development and capacity-building initiatives to strengthen teachers' ability to integrate technology effectively in instruction (Ampang, 2023; Casilao et al., 2025; Dioquino & Paglinawan, 2024). Furthermore, Andarwulan et al. (2021) emphasized that technology proficiency and readiness are critical factors influencing teachers' adoption of digital tools.

Summary of the Extent of Technology Integration in Teachers' Instructional Practices
An overview of teachers' technology integration across five domains: Administrative Use, Instructional Use, Communication Use, Professional Development Use, and Technology Proficiency Use, revealed varied levels of practice. Instructional Use obtained the highest rating (M=3.53, SD=0.88), indicating active and effective use in teaching. At the same time, the other domains were generally rated as moderate, indicating less consistent use beyond direct instruction. The results suggest that teachers are most confident using technology for instructional tasks, while applications for administration, communication, professional growth, and broader digital proficiency remain less developed.

Table 12. *Summary of the Extent of Technology Integration in Teachers' Instructional Practices*

Indicators	Mean	SD	Interpretation
Administrative Use	3.15	0.68	Moderate Extent
Instructional Use	3.53	0.88	High Extent
Communication Use	3.00	1.08	Moderate Extent
Professional Development Use	3.14	0.94	Moderate Extent
Technology Proficiency Use	3.00	0.96	Moderate Extent
Overall Mean	**3.16**	**0.15**	**Moderate Extent**

Note: (1.00-1.80 =Very Low Extent, 1.81-2.60 = Low Extent, 2.61-3.40=Moderate Extent, 3.41-4.20 = High Extent, 4.21- 5.00 =Very High Extent)

These findings highlight the importance of school heads' digital leadership in mentoring teachers, providing resources, and fostering digital competencies across all domains. However, in resource-constrained contexts such as BARMM, limitations in ICT infrastructure and inconsistent training may weaken the impact of leadership on technology adoption (Ampang, 2023). From the perspective of the Technology Acceptance Model (TAM), teachers' integration of technology depends not only on leadership support but also on their perceived usefulness and ease of use of digital tools. Even with strong leadership, if teachers perceive technology as difficult to use or not directly beneficial to their task, adoption may remain limited (Andarwulan et al., 2021; Casilao et al., 2025).

Relationship Between School Heads' Digital Leadership and Teachers' Technology Integration
Correlation analysis revealed a weak positive but statistically non-significant relationship between school heads' digital leadership and teachers' technology integration *(Kendall's τ = 0.14, p = .587)*. Since the *p-value (.587)* exceeds the significance level *(0.05),* the null hypothesis is accepted. This indicates that, while school heads demonstrate high levels of digital leadership, these practices do not necessarily translate into increased technology integration among teachers. Although the relationship was not statistically significant, the weak positive coefficient suggests a potential practical association. The limited number of school heads may have reduced statistical power, potentially obscuring a meaningful effect. Therefore, the findings should be interpreted cautiously, as digital leadership may still influence teachers' technology integration indirectly through mediating factors such as teacher readiness, infrastructure, and institutional support.

Table 13. *Correlation Analysis Between School Heads' Digital Leadership and Teachers' Technology Integration*

Variables	Kendall's τ	*p*-value	Decision
School Heads' Digital Leadership vs. Teachers' Technology Integration	0.14	.587	Accept null hypothesis

Note: (0.00 to ±0.10 =No Correlation, ±0.11 to ±0.30= Weak Correlation, ±0.31 to ±0.50=Moderate Correlation, ±0.51 to ±0.70= Strong Correlation, ±0.71 to ±1.00=Very Strong Correlation)

Teachers' technology integration appears to be influenced more by contextual and structural factors, such as ICT infrastructure, internet connectivity, and professional development opportunities, than by leadership practices alone. In resource-constrained contexts such as BARMM, limitations, including inadequate facilities and inconsistent training, may weaken the observable impact of leadership (Ampang, 2023). From the perspective of the Technology Acceptance Model (TAM), technology adoption depends on perceived usefulness and ease of use; thus, even strong digital leadership may have a limited effect if teachers perceive digital tools as difficult to use or not directly beneficial. Digital Leadership Theory further suggests that leaders influence technology adoption indirectly through mediating factors such as teacher readiness, digital competence, institutional support, and school culture (Malik, 2023).

Conclusion

The study found that school heads in the Buluan District demonstrate a high level of digital leadership across five key areas: Visionary Leadership, Digital-age Learning Culture, Professional Excellence, Systematic Improvement, and Digital Citizenship. Notably, the highest levels of practice were observed in Systematic Improvement, Digital-age Learning Culture, and Digital Citizenship, indicating strong engagement in fostering innovation and supporting digital transformation in schools. Meanwhile, teachers demonstrated moderate levels of technology integration in Administrative Use, Communication Use, Professional Development Use, and Technology Proficiency Use, while Instructional Use was rated high. Although school heads exhibited strong digital leadership, no statistically significant correlation was found between their leadership practices and teachers' technology integration. This finding is limited by the correlational design and the multi-level structure of the data, with teachers nested within schools. Teacher scores were aggregated at the school level, but the small number of schools limits generalizability, so results should be interpreted with caution. These findings suggest that leadership alone may not suffice to enhance classroom technology use. Strengthening teachers' capacity requires targeted professional development, mentoring, ICT infrastructure, and a supportive school culture. Future research could examine mediating factors such as teacher readiness and organizational culture, and employ multi-level modeling to more accurately assess the impact of digital leadership on classroom practices.

Conflict of Interests
The author declares no conflict of interest.

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