Assessing Institutional Leadership, AI Pedagogy, and Digital Literacy Capacity for Artificial Intelligence Integration in Public Secondary Schools

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ABSTRACT

The growing integration of artificial intelligence (AI) in education has intensified the need for schools to develop leadership capacity, pedagogical readiness, and digital literacy competencies that support effective and ethical technology adoption. Despite recent policy initiatives promoting AI integration in Philippine basic education, empirical evidence regarding the readiness of public secondary schools, particularly in rural contexts, remains limited. This study assessed the level of institutional leadership competency, AI pedagogy implementation among teachers, and ICT coordinators' digital literacy capacity in four public secondary schools in the Bunawan District, Division of Agusan del Sur, Philippines.

Using a quantitative descriptive research design, data were collected from school leaders, teachers, and ICT coordinators through researcher-developed and expert-validated questionnaires anchored on UNESCO's AI competency principles and contemporary digital literacy frameworks. Descriptive statistics, specifically mean and standard deviation, were employed to determine the levels of competency and implementation across the identified domains.

Results revealed that school leaders demonstrated a competent level of institutional leadership competency (M = 3.27, SD = 0.93), with AI pedagogy and curriculum innovation emerging as the strongest area. Teachers exhibited a mostly implemented level of AI pedagogy integration (M = 3.94, SD = 0.76), particularly in ethical governance and professional development practices. Similarly, ICT coordinators demonstrated a mostly implemented level of digital literacy capacity (M = 3.75, SD = 0.75), with pedagogical innovation and curriculum integration identified as their strongest domain. Across the three domains, ethical governance, professional capacity building, and infrastructure support emerged as areas requiring further improvement.

The findings indicate that public secondary schools possess foundational readiness for AI integration; however, sustained progress requires coordinated interventions focused on leadership development, continuous professional learning, strengthened ICT infrastructure, and institutionalized AI governance frameworks. These findings provide empirical evidence to support school improvement planning, policy development, and sustainable digital transformation initiatives in Philippine basic education.

Keywords: Artificial Intelligence Integration, Digital Literacy, Educational Leadership, AI Pedagogy, ICT Coordinators, Public Secondary Schools

INTRODUCTION

Artificial intelligence (AI) is increasingly transforming educational systems by reshaping teaching practices, assessment methods, administrative processes, and learner engagement. As AI technologies become more

accessible, educational institutions are expected to develop the competencies and organizational capacities necessary to integrate these innovations effectively and responsibly. International organizations such as UNESCO and the Organization for Economic Co-operation and Development (OECD) emphasize that successful AI integration requires not only technological resources but also strong leadership, pedagogical readiness, ethical governance, and digital literacy among educational stakeholders (OECD, 2023; UNESCO, 2024). Consequently, AI and digital literacy have emerged as essential components of educational transformation, enabling schools to prepare learners for participation in an increasingly digital and technology-driven society.

Empirical studies indicate that the successful implementation of AI in education depends on the combined capacities of school leaders, teachers, and ICT personnel. School leaders play a critical role in establishing strategic direction, policy alignment, and resource allocation, while teachers translate AI tools into meaningful learning experiences through effective pedagogical practices. ICT coordinators, meanwhile, facilitate digital transformation by providing technical support, managing technological resources, and strengthening digital literacy initiatives (Jančařík & Hubert, 2024; Tømte & Wollscheid, 2024). In the Philippine context, the Department of Education has introduced initiatives such as the Revised DepEd Computerization Program and the Education Center for Artificial Intelligence Research (E-CAIR) to promote digital transformation and responsible AI integration in schools (DepEd, 2023; DepEd, 2025). However, many public schools, particularly those in rural and geographically isolated areas, continue to experience challenges related to inadequate infrastructure, unstable internet connectivity, limited access to digital resources, and insufficient professional development opportunities (Rodrigo & Talandron-Felipe, 2024; UNICEF Philippines, 2023).

Despite increasing scholarly interest in AI integration, existing studies have largely focused on individual aspects such as teacher readiness, digital literacy competencies, technology adoption, or infrastructure concerns. Limited research has examined institutional leadership competency, AI pedagogy implementation, and ICT coordinators' digital literacy capacity as interconnected dimensions of school readiness for AI integration. Furthermore, empirical evidence from rural Philippine public secondary schools remains scarce, despite the unique contextual challenges that may influence technology adoption and implementation. This gap limits the availability of comprehensive evidence needed to inform leadership practices, capacity-building initiatives, and policy interventions that support sustainable and responsible AI integration in public education (Lumanlan et al., 2025; Malacapay, 2025; Navarro, 2024).

This study assessed the level of institutional leadership competency, AI pedagogy implementation among teachers, and ICT coordinators' digital literacy capacity in public secondary schools in the Bunawan District, Division of Agusan del Sur. Specifically, it examined key dimensions of leadership, pedagogy, and digital literacy that influence school readiness for AI integration. The findings are expected to provide empirical evidence that can inform school improvement planning, professional development programs, policy formulation, and future initiatives aimed at promoting ethical, sustainable, and effective AI integration in Philippine public education.

Research questions:

1. What is the level of institutional competency for school leaders adapting UNESCO's core principles in the following areas:

    1.1. Strategic planning for AI integration in pedagogy;

    1.2. Ethical Governance and Policy for transparent AI use;

    1.3. Leadership for capacity building on AI pedagogy;

    1.4. AI pedagogy and curriculum innovation; and

    1.5. technical innovation and sustainable infrastructure?

2. What is the level of AI pedagogy implementation of teachers along the five indicators:

    2.1. teacher competency and professional development;

2.2. integration into curriculum and pedagogy;

2.3 ethical governance and policy;

2.4. development of student competencies in AI literacy;

2.5. Resource and Infrastructure Support?

3. What is the level of ICT coordinators' capacity to implement digital literacy in terms of:

3.1. digital vision;

3.2. Professional development Capacity building;

3.3. Resource Curation and infrastructure management;

3.4. ethical and inclusive leadership; and

3.5. pedagogical innovation and curriculum integration.?

By examining these interconnected dimensions, the study provides a comprehensive assessment of school readiness for AI integration within a rural public-school context. The findings are expected to contribute empirical evidence that can inform school improvement planning, leadership development initiatives, capacity-building programs, and policy interventions aimed at promoting ethical, sustainable, and effective AI integration in Philippine basic education.

LITERATURE REVIEW

The integration of AI and digital literacy in education is a multidimensional process shaped by the interplay of institutional leadership, instructional practice, and technical support. This review synthesizes scholarship across three key domains that form the conceptual foundation of this study.

Institutional Leadership Competency in AI Integration

The successful integration of artificial intelligence (AI) in education depends significantly on the capacity of school leaders to provide strategic direction, establish supportive policies, and create conditions that foster innovation. Educational leadership has evolved beyond traditional administrative functions to include digital leadership competencies that enable schools to respond effectively to emerging technologies. UNESCO (2024) emphasizes that school leaders play a critical role in promoting ethical AI use, supporting professional learning, managing organizational change, and ensuring that technological initiatives align with educational goals. Similarly, the OECD (2023) highlights that effective digital transformation is strongly associated with leadership practices that encourage collaboration, evidence-based decision-making, and continuous improvement.

Recent studies indicate that leadership competency influences the extent to which schools adopt and sustain technology-related innovations. Leaders who demonstrate strong strategic planning and resource management are more likely to facilitate successful implementation of digital initiatives and cultivate a culture of innovation among teachers and staff. However, research also suggests that many educational leaders continue to face challenges related to AI governance, policy implementation, and infrastructure development, particularly in resource-constrained educational settings (Rodrigo & Talandron-Felipe, 2024). These findings underscore the importance of assessing institutional leadership competency as a key determinant of school readiness for AI integration.

AI Pedagogy Implementation of Teachers

Teachers are central to the successful implementation of AI in educational settings because they directly influence how technology is translated into meaningful learning experiences. AI pedagogy refers to the purposeful and responsible integration of AI technologies into teaching, learning, assessment, and instructional decision-making processes. UNESCO (2024) notes that effective AI pedagogy requires teachers to possess not only technical

proficiency but also pedagogical and ethical competencies that enable them to utilize AI tools appropriately and responsibly.

Empirical studies indicate that teachers generally recognize the potential benefits of AI for enhancing instruction, personalizing learning, and improving assessment practices. However, actual implementation often depends on access to professional development opportunities, technological resources, and institutional support systems. Research conducted in the Philippine context found that while educators demonstrate positive attitudes toward AI adoption, challenges related to limited training, inadequate infrastructure, and uncertainty regarding ethical considerations continue to affect implementation (Lumanlan et al., 2025; Malacapay, 2025). These findings suggest that teacher readiness remains a critical factor influencing the effectiveness and sustainability of AI integration in schools.

ICT Coordinators' Digital Literacy Capacity

ICT coordinators play an increasingly important role in supporting digital transformation within educational institutions. Traditionally responsible for technical maintenance and infrastructure management, ICT coordinators are now expected to contribute to instructional innovation, professional development, and technology integration initiatives. Their responsibilities include managing digital resources, supporting teachers in the use of educational technologies, facilitating capacity-building activities, and ensuring the effective operation of ICT systems within schools (Jančařík & Hubert, 2024).

Studies have shown that schools with competent ICT coordinators often demonstrate higher levels of technology adoption and implementation. ICT coordinators serve as intermediaries between administrative leadership and classroom practitioners, helping to bridge technical and pedagogical needs. Nevertheless, challenges such as limited professional development opportunities, role ambiguity, and insufficient institutional support may hinder their effectiveness. UNESCO (2024) further emphasizes the need for ICT personnel to develop competencies related to ethical AI governance, cybersecurity, data privacy, and digital inclusion as schools increasingly adopt AI-enabled technologies.

Challenges and School Readiness for AI Integration

The literature consistently identifies infrastructure limitations, professional development needs, ethical concerns, and governance issues as significant barriers to AI integration in education. Although governments and educational institutions continue to invest in digital transformation initiatives, disparities in technological access and organizational readiness remain evident, particularly in rural and developing contexts. In the Philippines, public schools frequently encounter challenges related to inadequate connectivity, insufficient digital devices, and limited access to specialized technical support, which may constrain the implementation of AI-enhanced educational practices (DepEd, 2023; UNICEF Philippines, 2023).

Beyond infrastructure, ethical considerations have emerged as a growing concern in AI adoption. Issues related to data privacy, algorithmic bias, transparency, and responsible use require schools to establish clear governance structures and accountability mechanisms. Research suggests that schools with stronger leadership support, effective teacher preparation, and competent ICT personnel are better positioned to address these challenges and sustain AI-related innovations (OECD, 2023; UNESCO, 2024). Consequently, school readiness for AI integration should be viewed as a multidimensional construct influenced by leadership capacity, pedagogical implementation, technical support, and organizational conditions.

The reviewed literature demonstrates that the successful integration of AI in education is influenced by the interaction of institutional leadership competency, teacher AI pedagogy implementation, and ICT coordinators' digital literacy capacity. Educational leaders provide strategic direction and governance, teachers facilitate instructional integration, and ICT coordinators ensure technical and operational support. Despite increasing attention to AI integration, existing studies have largely examined these dimensions independently. Limited empirical evidence exists regarding how these capacities collectively influence school readiness for AI integration, particularly in rural Philippine public secondary schools. This gap highlights the need for a comprehensive assessment that examines leadership, pedagogy, and digital literacy as interconnected dimensions of AI readiness, which serves as the focus of the present study.

METHODS

Research Design

This study employed a quantitative descriptive research design to assess the level of institutional leadership competency, AI pedagogy implementation among teachers, and ICT coordinators' digital literacy capacity in public secondary schools. The descriptive approach was appropriate because the study sought to determine the existing conditions and perceived levels of competency and implementation across identified domains without manipulating variables or establishing causal relationships. This design enabled the systematic assessment of school readiness for artificial intelligence (AI) integration based on the perspectives of key educational stakeholders.

Research Locale

The study was conducted in the Bunawan District, Division of Agusan del Sur, which consists of four public secondary schools. The district represents a rural educational setting characterized by limited access to ICT resources, inconsistent internet connectivity, and varying levels of digital infrastructure. These conditions provide a relevant context for evaluating school readiness for AI integration and digital literacy development.

Respondents of the Study

The participants consisted of 115 educational stakeholders drawn from four public secondary schools in the Bunawan District, Division of Agusan del Sur. The respondents included 95 classroom teachers, 12 master teachers, 4 school heads, and 4 ICT coordinators. Teachers were selected through stratified random sampling to ensure proportional representation across participating schools, while school heads, master teachers, and ICT coordinators were included through complete enumeration due to their limited population size and direct involvement in leadership, instructional supervision, and technology-related initiatives.

For data analysis, master teachers were grouped with school leaders in the assessment of institutional leadership competency because of their instructional leadership functions and supervisory responsibilities. Consequently, responses from master teachers were included in the leadership dataset presented in Table 1 and were not incorporated into the teacher AI pedagogy implementation dataset presented in Table 2.

Research Instruments

Data was collected using three researcher-developed questionnaires, each tailored to the specific role and domain of its target respondent group. Each questionnaire consisted of two parts: (1) a demographic profile section capturing information on position, years of service, educational attainment, and ICT-related training; and (2) a set of domain-specific Likert-scale items rated on a five-point response scale. The study utilized two distinct five-point Likert scales depending on the respondent group. For school leaders, the questionnaire measured institutional leadership competency using the following scale: 5 = Extremely Competent, 4 = Highly Competent, 3 = Competent, 2 = Nearly Competent, and 1 = Not Competent at All. For teachers and ICT coordinators, the questionnaires measured the level of implementation using the following scale: 5 = Fully Implemented, 4 = Mostly Implemented, 3 = Partially Implemented, 2 = Slightly Implemented, and 1 = Not Implemented.

The institutional leadership questionnaire was adapted from UNESCO's (2023) AI competency framework for educational leaders and assessed the five leadership subdomains constituting Research Question 1. The teacher AI pedagogy questionnaire measured five dimensions of classroom implementation corresponding to Research Question 2. The ICT coordinator questionnaire assessed five dimensions of digital literacy capacity aligned with Research Question 3.

Validity and Reliability

Content validity was established through expert review by specialists in educational leadership, educational technology, and research methodology. The instruments were evaluated for clarity, relevance, construct alignment, and contextual appropriateness. Revisions were incorporated based on expert recommendations prior to pilot testing.

A pilot study was conducted among respondents from public secondary schools outside the study area but with comparable characteristics. Reliability testing using Cronbach's alpha produced coefficients exceeding the acceptable threshold of 0.70, indicating satisfactory internal consistency and reliability of the instruments.

Data Gathering Procedure

Following approval from the appropriate educational authorities and school administrators, the validated questionnaires were administered to the participants. Data were collected through printed and digital survey forms depending on accessibility and respondent preference. Completed questionnaires were reviewed for completeness, encoded, and prepared for statistical analysis.

Data Analysis

Descriptive statistics were employed to analyze the data. Mean and standard deviation were computed to determine the levels of institutional leadership competency, AI pedagogy implementation, and ICT coordinators' digital literacy capacity across the identified domains.

For institutional leadership competency, mean scores were interpreted as follows: 4.21–5.00 = Extremely Competent; 3.41–4.20 = Highly Competent; 2.61–3.40 = Competent; 1.81–2.60 = Nearly Competent; and 1.00–1.80 = Not Competent at All. For teachers and ICT coordinators, mean scores were interpreted as follows: 4.21–5.00 = Fully Implemented; 3.41–4.20 = Mostly Implemented; 2.61–3.40 = Partially Implemented; 1.81–2.60 = Slightly Implemented; and 1.00–1.80 = Not Implemented.

Ethical Considerations

The study adhered to established ethical standards for educational research. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. Participants were informed of the purpose of the study, their right to withdraw at any stage, and the confidential treatment of their responses. All collected data were anonymized, securely stored, and used exclusively for research purposes in compliance with applicable data privacy regulations.

RESULTS AND DISCUSSIONS

This section presents the findings for each of the three study domains: institutional leadership competency, AI pedagogy implementation among teachers, and ICT coordinators' digital literacy capacity. Results are organized by research question and reported at both the subdomain and overall levels.

Institutional Leadership Competency

Table 1 presents the mean scores and standard deviations for each subdomain of institutional leadership competency, as well as the overall domain mean, based on the responses of school leaders.

Table 1. Level of Institutional Competency for School Leaders adapting UNESCO's core principles

Indicator	Mean	Standard Deviation	Adjectival Rating
Strategic Planning for AI Integration	3.18	1.05	Competent
Ethical Governance and Transparent AI Use	3.43	0.86	Competent
Leadership for Capacity Building on AI Pedagogy	3.01	0.96	Competent
AI Pedagogy and Curriculum Innovation	3.60	0.93	Highly Competent
Technical Innovation and Sustainable Infrastructure	3.13	0.85	Competent
OVERALL MEAN	**3.27**	**0.93**	**Competent**

The overall mean of 3.27 (SD = 0.93) places school leaders at a competent, though closer to the lower boundary of this level, indicating moderate institutional readiness to guide AI integration. Among the subdomains, AI

pedagogy and curriculum innovation obtained the highest score (M = 3.60, SD = 0.93), suggesting that school leaders are most actively engaged in promoting instructional improvement and supporting curriculum-level technology initiatives. Ethical governance and transparent AI use ranked second (M = 3.43), indicating awareness of accountability structures surrounding technology use, albeit without reaching a consistently strong level of implementation.

In contrast, leadership for capacity building on AI pedagogy received the lowest mean (M = 3.01, SD = 0.96), indicating that structured, sustained professional development programs for staff remain underdeveloped. Strategic planning for AI integration (M = 3.18) and technical innovation and sustainable infrastructure (M = 3.13) also scored in the lower range of the competent level, reflecting constraints in long-range planning and infrastructure development that are common in rural school districts with limited budgetary autonomy.

AI Pedagogy Implementation among Teachers

Table 2 presents the mean scores and standard deviations for each subdomain of AI pedagogy implementation among teachers, together with the overall domain mean.

Teachers demonstrated an overall mean of 3.94 (SD = 0.76), placing AI pedagogy implementation at the mostly implemented level. This finding indicates that teachers are actively integrating AI tools and practices into classroom instruction to a considerable degree. Ethical governance and policy obtained the highest subdomain mean (M = 4.20, SD = 0.73), approaching the fully implemented threshold, suggesting that teachers have internalized principles of responsible and policy-aligned AI use. Teacher competency and professional development ranked second (M = 4.01, SD = 0.68), reflecting active engagement in skill development related to AI-enhanced instruction.

Table 2. Level of AI Pedagogy Implementation of Teachers

Indicator	Mean	Standard Deviation	Adjectival Rating
Teacher Competency and Professional Development	4.01	0.68	Mostly Implemented
Integration into Curriculum and Pedagogy	3.84	0.88	Mostly Implemented
Ethical Governance and Policy	4.20	0.73	Mostly Implemented
Development of Student Competencies in AI Literacy	3.85	0.78	Mostly Implemented
Resource and Infrastructure Support	3.83	0.74	Mostly Implemented
OVERALL MEAN	**3.94**	**0.76**	**Mostly Implemented**

Resource and infrastructure support yielded the lowest mean (M = 3.83, SD = 0.74), though still within the mostly implemented range. The relatively low standard deviation across subdomains (0.68–0.88) suggests considerable consistency in teachers' perceptions, indicating that the challenges identified, particularly in infrastructure are systemic rather than idiosyncratic. Curriculum integration (M = 3.84) and student AI literacy development (M = 3.85) also scored in the lower portion of the mostly implemented range, pointing to areas where instructional capacity is developing but has not yet reached consistent, high-level implementation.

ICT Coordinators' Digital Literacy Capacity

Table 3 presents the mean scores and standard deviations for each subdomain of ICT coordinators' digital literacy capacity and the overall domain mean.

Table 3. Level of ICT Coordinators' Capacity to Implement Digital Literacy

Indicator	Mean	Standard Deviation	Adjectival Rating
Digital Vision	3.65	0.60	Mostly Implemented
Professional Development & Capacity Building	3.65	1.08	Mostly Implemented

Indicator	Mean	Standard Deviation	Adjectival Rating
Resource Curation & Infrastructure Management	3.75	0.78	Mostly Implemented
Ethical & Inclusive Leadership	3.55	0.34	Mostly Implemented
Pedagogical Innovation & Curriculum Integration	4.15	0.96	Mostly Implemented
OVERALL MEAN	**3.75**	**0.75**	Mostly Implemented

ICT coordinators achieved an overall mean of 3.75 (SD = 0.75), placing their digital literacy capacity at the mostly implemented level. Pedagogical innovation and curriculum integration emerged as the highest-rated subdomain (M = 4.15, SD = 0.96), approaching the upper boundary of mostly implemented and indicating that ICT coordinators are actively supporting instructional technology integration alongside their technical duties. Resource curation and infrastructure management (M = 3.75) and digital vision (M = 3.65) also demonstrated solid implementation.

Ethical and inclusive leadership received the lowest mean (M = 3.55), though it remained within the mostly implemented range. Notably, this subdomain also exhibited the lowest standard deviation (SD = 0.34), indicating an unusually high degree of consensus among ICT coordinators in their self-assessment, a pattern that may reflect shared awareness of existing gaps in ethical AI governance and inclusive practices. Professional development and capacity building (M = 3.65, SD = 1.08) showed the highest variability across coordinators, suggesting uneven access to advanced training opportunities across the four schools in the district.

DISCUSSION

The findings of this study reveal that public secondary schools in the Bunawan District have established foundational capacities for AI and digital literacy integration across three critical domains, while simultaneously surfacing persistent and cross-cutting challenges that constrain the depth and sustainability of implementation. This discussion situates the results within the broader empirical and theoretical literature to draw out their implications for practice and policy.

Institutional Leadership Competency

The competent-level rating for institutional leadership (M = 3.27) is consistent with research indicating that school leaders in developing contexts often demonstrate adequate awareness of digital transformation imperatives but face structural barriers to translating this awareness into sustained, system-level action (Rodrigo & Talandron-Felipe, 2024). The finding that AI pedagogy and curriculum innovation received the highest leadership score (M = 3.60) aligns with UNESCO's (2023) observation that educational leaders tend to prioritize visible, instructional-facing innovations that offer tangible evidence of progress, while systemic functions such as capacity building and infrastructure planning, which require longer time horizons and greater resource commitments, receive comparatively less sustained attention.

The lowest-rated subdomain, leadership for capacity building (M = 3.01), represents a particularly consequential gap. When institutional leaders fail to systematically develop the capacities of their staff, the gains achieved by individual teachers or ICT coordinators are unlikely to scale or endure beyond the tenure of current personnel. This finding reinforces the argument advanced by Berkovich (2025) and Adams and Thompson (2025) that digital leadership in the AI era demands a reorientation from administrative compliance to active, distributive capacity development.

AI Pedagogy Implementation Among Teachers

The mostly implemented rating for AI pedagogy (M = 3.94) suggests a relatively robust level of classroom-level integration, which is encouraging given the rural and resource-constrained context of the study sites. The high rating for ethical governance and policy (M = 4.20) is a notable finding that partially diverges from the common characterization of frontline educators as insufficiently informed about the ethical dimensions of AI use (UNESCO, 2023). It may indicate that DepEd's policy communications regarding acceptable use and data governance have been effectively internalized at the teacher level, even in areas where infrastructure remains underdeveloped.

The lowest-performing area, resource and infrastructure support (M = 3.83), corroborates the well-documented digital divide between rural and urban Philippine public schools (UNICEF Philippines, 2023; Navarro, 2024). This finding is theoretically significant because it demonstrates that even where teacher motivation and professional learning are relatively strong, as reflected in the teacher competency subdomain (M = 4.01), infrastructure deficits can function as a ceiling constraint on the quality and consistency of AI pedagogy implementation. This is consistent with OECD (2023) analyses showing that systemic infrastructure investment is a prerequisite, not merely a complement, to professional learning initiatives for teachers.

ICT Coordinators' Digital Literacy Capacity

The mostly implemented rating for ICT coordinators (M = 3.75) reflects the expanded and increasingly instructional nature of their role in contemporary schools, as documented by Tømte and Wollscheid (2024) and Jančařík and Hubert (2024). The strong performance on pedagogical innovation and curriculum integration (M = 4.15) suggests that ICT coordinators in the Bunawan District have moved beyond purely technical functions toward active roles as instructional technology facilitators, a transition that literature identifies as essential to bridging policy intent and classroom practice.

The lowest-rated subdomain, ethical and inclusive leadership (M = 3.55), warrants particular attention. While the mean remains within the mostly implemented range, the near-universal consensus reflected by the very low standard deviation (SD = 0.34) suggests that this gap is not an artifact of measurement variability but a genuinely shared experience among ICT coordinators. This finding echoes the U.S. Department of Education's (2023) report on systemic underinvestment in ethical AI preparation for ICT professionals, and UNESCO's (2023) warning that the rapid deployment of AI tools without commensurate attention to data privacy, algorithmic fairness, and digital inclusion creates significant institutional risk. Addressing this gap requires not only individual professional development but also the development of school-level and district-level AI governance frameworks with clearly articulated roles, responsibilities, and accountability mechanisms.

Cross-Domain Synthesis

Taken together, the three domains reveal a pattern of moderate institutional readiness characterized by active, goodwill-driven implementation efforts that are constrained by structural limitations. This pattern is consistent with what UNESCO (2023) and the OECD (2023) describe as the "implementation gap", the distance between policy aspiration and on-the-ground practice in education systems with insufficient resources and uneven capacity distribution. It is also consistent with Spillane's (2006) distributed leadership framework, which predicts that when strategic direction (leadership), instructional practice (teachers), and operational support (ICT coordinators) are not coherently aligned and mutually reinforcing, system-level improvement stalls at moderate levels of implementation.

Notably, ethical governance emerged as a recurring concern across institutional leadership, teacher AI pedagogy implementation, and ICT coordinators' digital literacy capacity. This convergence suggests that responsible AI adoption cannot be addressed through isolated professional development initiatives alone. Instead, it requires formal governance structures, district-level policy support, and clearly defined accountability mechanisms that ensure data privacy, transparency, equity, and responsible AI use. Establishing localized governance systems may therefore represent a critical next step in advancing sustainable AI integration within public secondary schools.

CONCLUSION AND RECOMMENDATION

This study assessed the levels of institutional leadership competency, AI pedagogy implementation, and ICT coordinators' digital literacy capacity in public secondary schools within the Bunawan District, Division of Agusan del Sur, Philippines. The findings demonstrate that these schools have developed a moderate foundation for AI and digital literacy integration, with each domain assessed at either the competent or mostly implemented level.

School leaders exhibit adequate competence in AI-related initiatives, most notably in AI pedagogy and curriculum innovation, but face significant gaps in structured capacity-building and long-term infrastructure

development. Teachers demonstrate active engagement in AI-enhanced instruction, with strong performance in ethical governance and professional development, but continue to be constrained by resource and infrastructure limitations. ICT coordinators effectively support digital initiatives, particularly in pedagogical innovation, but collectively identify ethical and inclusive leadership as an underdeveloped area requiring systematic attention.

The recurring concerns related to ethical governance across school leaders, teachers, and ICT coordinators suggest the need for district-level governance mechanisms that can provide policy guidance, technical oversight, and ethical safeguards for AI implementation.

The overarching conclusion of this study is that while the Bunawan District's public secondary schools possess the goodwill, general awareness, and initial capacity to integrate AI and digital literacy into education, the transition to consistent, high-quality, and sustainable implementation requires deliberate, coordinated, and systemic interventions that address leadership development, infrastructure investment, professional learning, and ethical governance simultaneously. Piecemeal approaches that target only one domain are unlikely to produce durable results.

The Schools Division of Agusan del Sur may consider establishing District AI Advisory Committees composed of school leaders, ICT coordinators, curriculum specialists, and data privacy focal persons. These committees may assist schools in developing localized AI governance guidelines, monitoring compliance with data privacy regulations, facilitating ethical AI implementation, and providing technical support to resource-constrained schools. Such a mechanism would strengthen institutional accountability while promoting responsible and sustainable AI integration across the district.

Future studies may examine the relationships and interactions among institutional leadership, teacher practice, and ICT coordination in shaping AI integration outcomes, using correlational and mixed-methods designs. Longitudinal research tracking implementation progress over multiple academic years would also provide valuable evidence for evaluating the effectiveness of capacity-building and infrastructure interventions.

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